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A JOURNAL DEVOTED
 TO BEES
 AND HONEY
 AND HOME
 INTERESTS.

ILLUSTRATED
 SEMI-MONTHLY
 Published by THE A. ROOT CO.
 MEDINA, OHIO.
 \$1.00 PER YEAR

Vol. XXV.

JUNE 1, 1897.

No. 11



THE *Pacific Bee Journal* reports good prospects in California. Glad of it. Some nice people there.

BOKHARA CLOVER probably is not so called because the seed is hulled, but because it comes from Bokhara, in Asia.

BOTTOM BOARDS painted with heated coal-tar 27 years ago are good yet, says C. P. Dadant, in *American Bee Journal*.

REPLYING, Mr. Editor, to your remark, page 361, the extra-thin foundation that didn't suit me was several years ago, so of course it was old process.

EDITOR YORK thinks there is a possibility that, in the near future, bee-keepers might do well to co-operate with the American Fruit-growers' Union in effecting sales of honey.

TOOK FIRST HONEY of the season May 8. Didn't extract—just shook three combs, getting two pounds of thin dandelion honey—light, with a very pronounced flavor: liked by some, disliked by others.

R. C. AIKIN is heterodox when he says of hive-escapes, "They will not do the work rapidly enough;" but some others of us can't wait for them at out-apiaries, and don't like to offer a premium to thieves by leaving them on over night."

TREES barked by rabbits can be saved, says Fred Grundy, in *Epitomist*, by splitting open a drain-tile, wiring the two parts together around the tree, then filling up the space with earth. Why not prevent the gnawing in the same way?

LE PROGRES APICOLE says the British Bee-keeper's Guide Book has reached its thirty thousandth copy, and that no other apicultural work has reached so large a circulation.

Mais, mon cher Progres, Root's A B C has about doubled that.

THE MORE STORES a colony has in winter, the less it consumes; for honey is a splendid thermic regulator, making the bees suffer less from sudden changes of temperature, so consuming less. — Dr. L. Latanne, in *Progres Apicole*. [There may be something in this.—Ed.]

C. C. PARSONS, in *American Bee Journal*, says that, after a trial of seven years, he has never had a swarm desert its hive, no matter what the shade or ventilation, if he put into the middle of the hive an empty comb, filling out with frames of foundation or starters.

WHAT YOU SAY, p. 371, Mr. Editor, reminds me. Years ago a citizen of Marengo called my attention to some shade-trees four feet high in his yard that he had just got from the nursery. They were lindens, and he had cut down some big basswoods to make room for them. Actual fact!

WATERING BEES. Take a common stone crock; cut a board $\frac{1}{2}$ inch smaller than the diameter of the crock, then bore several $\frac{3}{8}$ holes in it, and fill each hole with a wick. Put more boards under it when water-soaked, so as to keep it a little above water level.—Michael Haas, in *American Bee Journal*.

HIT 'EM AGAIN, friend A. I. (p. 387). The idea that a number of sensible people can not meet socially of an evening without eating something unseasonably is an absurdity worthy of the dark ages. But, say! You just report to us when you have a gathering of that kind at your house without feeding them. Dassent!

I'M NOT DIETING NOW—I'm eating. I never had so much fun in my life eating apples. Three for breakfast, three for dinner. When I don't eat three I eat four or five. Before the beef diet, half an apple was too much for me. [Yes, indeed; the beef diet, after one has been on it for a year, puts him in much better condition to eat articles of food that formerly were almost poisonous.—Ed.]

THE NEW UNION, since it has turned out there are to be two, needs another name so the old and new Union will not get mixed. "Alliance" has been suggested, also "League." The latter has the advantage of brevity. [I do not like either name. What is the matter with "Association"—the name we formerly had? "The United States Bee-keepers' Association"—that sounds well.—ED.]

R. A. TOBEY, p. 375, gives a fair showing of the variation in the weight of sections. While the average of all was 14 $\frac{3}{4}$ oz., that of the heaviest case was 16.6 oz., and that of the lightest 13.2 oz. Of course, single sections in the heaviest were more than 16.6, and in the lightest less than 13.2. Is it just the thing to sell such sections by the piece, charging as much for the lightest as the heaviest?

WM. McEVoy, Canada's Foul-brood Inspector, says the Wisconsin foul-brood law is the most perfect one in the world, and one that every State and province should copy after.—*American Bee Journal*. [McEvoy's opinion of the Wisconsin law is worth much, for certainly he ought to know. Perhaps it would be well for bee-journals to hold up this law as the ideal law for other States to enact.—ED.]

R. WILKIN thinks we ought to have a word to express the contents of a hive exclusive of the box containing the bees. Seems to me there are several new words needed. Who'll furnish them? [Supply-dealers, in referring to that which goes to make the inside of the hive, without the bees, speak of it as "inside furniture," as "fixtures," as "frames and sections." To my notion, the first name is the best.—ED.]

SUPERS ought to have been put on my hives the first week in May, according to the orthodox rule, that they should be put on as soon as white wax is seen along the top-bars. Possibly some of them might store dandelion honey in sections, but I'd rather have the honey worked up into bees for the clover crop. [The season is considerably later this year, and we shall have to make our calculations accordingly.—ED.]

PROF. A. J. COOK, in *American Bee Journal*, says, "We used to hear a good deal about dividing bees, or artificial swarming; but in these latter days I think very few attempt any increase except by natural swarming." Tut, tut, professor! don't think that, because we don't talk as much about it as when it was new, we don't practice it—lots of us. Last year I increased 121, only two of which were natural swarms, and one of them ran away before it was hived.

THAT GOOD-LOOKING AUSTRALIAN presents a strong argument in favor of queen-cells in drone-comb, p. 365. [Photography always tells the truth, and a half-tone reproduction is the same thing in printers' ink. If friend Jones

had told us what he could do, may be we might have disbelieved him; but when he gave us a peep of the thing itself, so that we could actually see it, then there was no room for doubt. I hope many of our readers will try the method there described.—ED.]

SO MAGIC CEREAL is ahead of postum cereal, is it? First I've heard of it. Can't you send me a sample, Ernest? [Just ask your grocer for it and he will have to get it. It is made, I think, by the Akron Cereal Co., Akron, O.; and while you are about it, ask him to give you a sample of "Gran-o." This is another substitute for coffee, and it is said to go twice as far as any other for the money. We are just trying it at our house, and have not come to any definite conclusion.—ED.]

BEES STINGING each other are generally supposed not to lose the sting. R. Wilkin rescued a queen from hostile bees, but one of them had stung her below the eye; and when pulled apart the sting and poison-sac remained firm with the queen, killing her. [It seems to me that, when I was working with the bees in queen-rearing, whenever a queen was stung in a ball she was more apt to hold in her body the sting she received than not. I remember very distinctly of drawing the stings from several queens, hoping thereby it would not be too late; but they were all fatal.—ED.]

PROF. BRUNER, so favorably known by those who attended the Lincoln convention, has been employed by the Argentine Republic to study the grasshopper plague they've had for ten years. He sailed April 24 from New York, having a year's leave of absence from the University of Nebraska. Success to him. [The selection of Prof. Bruner from the number of very able men in this country, by the Argentine Republic, is indeed a compliment. The bee-keepers who attended the Lincoln convention will not soon forget his very interesting lecture on the "Wild Bees of Nebraska," and the kindly way in which the many questions which were plied to him, right and left, were answered. If I mistake not, his selection was due to the fact that he is a real student of nature. He does not go to other authorities so much as he goes to Nature herself, and from her gleans the actual facts. From a boy up he has been a bug-hunter.—ED.]

"IT WOULD HAVE a tendency to keep others from making the same mistakes if we would be a little more frank in reporting ours," is a truth G. C. Greiner puts on page 367 that will bear repeating. If a department, "Mistakes and Blunders," is published in GLEANINGS, I'll promise not to skip it in my reading. ["Mistakes and Blunders" as a department in GLEANINGS—a capital idea! and for fear that I may forget to carry it out, I will ask you right now, doctor, to give us the first batch. They

may be short, like Straws, if you want them so, or they may be longer, just as you see fit to touch them up. After you have given us the first batch, then I should be glad to have Mr. Greiner give us the second; later on, perhaps Mr. Doolittle, Mr. Crane, Mr. Manum, and others, can keep the department alive. I am rather of the opinion that some of our best and most successful bee-keepers can give us some interesting and valuable facts from their experience. Such a department may show the truth of what Josh Billings once said: "Egspereience keeps a good skule, but the tewishun comes purty hi."—Ed.]

ON PAGE 343 it reads as if prosperity never brings a man nearer Christ. You don't mean that, do you? friend A. I. When I'm full of real gratitude for prosperity, I'm sure that is being brought nearer. [Dear old friend, it seems a sad reflection on humanity, but I am afraid it is true that prosperity seldom if ever moves one nearer to Christ Jesus. When I had that pleasant visit at your home some years ago, your pastor said to us something like this: "I presume each person who sits before me would like to take the risk of sudden prosperity; and each and all of you think *you* would be an exception to the general rule. But the sad fact remains, demonstrated over and over again, that there is more to be feared from riches than from poverty." Since I heard that, I have been watching for instances to the contrary; but if I have found them, they are few and far between.—A. I. R.]

UNCLE AMOS, why can't you be fair? You come down on me because I couldn't in four months do what Maria Fraser did in four years—make good jumbles without sugar or molasses. After four years she thinks she has found a recipe that can be relied on, but I don't think I could find it in twice four years on page 375. At any rate, I give it up. Now tell me where to find it. [My dear old friend, I will take back every word I have ever said against you, and I won't ever try to look down on you again if you will forgive my stupid blunder. We went and published the good lady's remarks about that beautiful honey-cake, and told how we manage it, and then left out the recipe entirely. I wonder what Maria Fraser thought of us, to see her recipe come out in that style. But, fortunately, we have succeeded in hunting up the letter, and fishing the recipe out of the waste-basket, and here it is: "Two cups honey; one cup butter; four eggs (mix well); one cup buttermilk (mix); one good quart flour; one level teaspoonful soda or saleratus. If it is too thin, stir in a little more flour. If too thin it will fall. It does not want to be as thin as sugar cake. I use very thick honey. Be sure to use the same cup for measure. Be sure to mix the honey, eggs, and butter well together."—A. I. R.]



By R. C. Atkin.

MARKETING HONEY; A VALUABLE ARTICLE.

This is another subject much written upon and talked about. However much has been said, the subject is by no means exhausted, and comes up at every convention, and will not settle.

Go with me into any grocery and look at the goods there handled. Every thing in the way of liquids, except perhaps vinegar, sorghum, and honey, are so put up that they can be handled by the piece. All solids are either in package form, or in such shape that they can very quickly be weighed or counted out. Vinegar, coal oil, and such, are measured out, it is true; but there is of necessity a vessel in each household for these things, and the vessel is taken to be filled again, when empty. Just think it over for yourself and answer the question: Is there a single article in the grocer's line so awkwardly handled as extracted honey? I have no particular criticism to make in regard to retailing comb honey, but I must say that extracted is very poorly marketed.

We put our extracted honey in 60-lb. cans, barrels, etc., and ship to the wholesale or commission dealer. These in turn sell it out to the retail men in small lots; and when they come to get out the honey they find it candied. Even if it did not candy, it is a hard article to retail in this way, because it must be kept warm or else the dealer must spend much time waiting on it to run out. I have retailed a number of tons of extracted honey, and I know what kind of a job it is. If you were a storekeeper, and had your choice of selling maple and other syrups in regular packages, or honey drawn out into the customer's vessel, would you not choose the regular package? I am sure you would, and that is just what is done.

But how are we to get it into regular packages? There is the rub. We have no suitable regular package—in fact, no regular retail package. The Root establishment is supposed to carry about every thing of value going, and I will just look over their list. First, I find glass vessels. There are the Powder and Muth jars. One-pound size costs about 4 cents each by the 100. Other glass packages of 1-pound capacity from 2½ cents to nearly 5 cents each. These are the prices *there*, not delivered to the producer. We must pay the freight on these, and then we must be at the expense of casing

or crating them in some safe way to ship. The result is, that by the time the honey is ready to go to the wholesale market it has cost us about 5 or 6 cents per pound for packages alone. If the honey is worth 5 and the packing 5 more, there is 10 cents right at your honey-house; and by the time we add freight, and commissions to both wholesale and retail dealer, say 1 cent freight and 25 per cent for commissions, it costs twice as much as the best sugar.

Of tin packages, first comes the 60-lb. can. These are wholesale packages, and cost us, the can and freight, $\frac{3}{8}$ of a cent per pound on the honey put in them. Next comes the 12-pound square screw-nozzle cans. These will come at about $1\frac{1}{4}$ cents per pound—possibly a little more. Then there is the "Jones honey-pails with screw-cap," that the catalog says "are the most convenient pails that we know of, that are suitable for shipping liquid honey in." One-pound size comes at $4\frac{1}{2}$ cents—all of 5 cents by the time we get it; five-pound pails at almost 2 cents per pound. There are next "tin pails with raised covers," but these do not seal, and will not answer. The last on the list is "Record's tight-seal cover pail." These are not made for honey, but for butter and lard. I don't know whether they will shut tight enough to risk shipping honey in them when they are stood on their heads or in any position other than right side up. The cost of these is a trifle less than the others.

These vessels are not crated or boxed ready to ship full of honey. Even if the cost were low enough, every apiarist is not fixed for crating them. By the time we crate them we have put the cost of packages considerably above the foregoing figures—just about what the honey now brings at wholesale in 60-lb. cans and barrels. We can not put honey in packages that cost as much as the honey alone will bring. Suppose the honey worth 4 cts. and the packing 4, then the freights, etc., on that, and "where are we at?" Do not forget that I am not talking about the local retail trade from our honey-houses, but the general markets.

We must have a regular package. We have a standard for comb honey, sections of certain weight, and so many in a case. A dealer can order so many cases of 12 or 24 pound size; and when he retails it he sells it out by the piece or pound, and no bother; but here we are with extracted honey in all sorts of vessels of wood, tin, or glass, some of the packages costing more than the honey itself can be bought for. The only way a retail dealer can get extracted honey to his customers is to get it put up for him by a local apiarist, or buy it in wholesale packages and then repack it, and run the cost to or above comb, or draw it out into the purchaser's pail. If we are to sell to bakers or manufacturers, then the large can or barrel is all right; but we want to sell for table use too,

and the purpose of this article is to tell why we do not, and how we can get the table trade.

Extracted honey is not nearly so largely used as it should and would be, because it is not put up so that the people can get it as they do the competitive sweets. I know that Mr. C. F. Muth and some others are doing good work; but Muth can not handle all the honey. What we must do is to get our goods in shape so that, when it is once packed, it is there to *stay till the consumer gets it*. Other syrups and sweets are so put up that the packages are regular, go from packer to wholesale house, and through the regular channels of trade, in unbroken cases till the local grocer gets it, when the case is broken and the original can sold to the consumer.

But how are we to get it so? At present I see but one way. We must co-operate. We can establish packing-houses at suitable places to receive the product in its vicinity. This house (or association) can have its trademark or label; buy its cans in car lots; can, case, and market the goods in a regular way. You will say, "Why not each apiarist pack his own honey, get his cans from the general house, or depot, and pack at home?" The reason why this will not work is plain. Suppose the apiarists about Denver would undertake this. Perhaps no two of them would grade just alike. Perhaps one out of 10, 25, or 50, would either ignorantly or willfully pack a lot of off-grade honey. It would, of course, go out with the rest, and eventually damage the reputation of the association or firm which guaranteed it. No; it must be packed by an experienced packer who knows his business. The farmer may just as well pack his own pork, or the fruit man his own apples; but these and other products must go to the regular packer. We may pack for local trade or special customers, but we can not do this for the general trade.

One difficulty that meets us here is that there is not enough honey produced. There, now, won't I catch it? The idea of saying there is not enough produced when we can not sell what we have! Yes, I say it, and it is a fact. If there were ten times as much produced there would be some inducement for capitalists to start packing-houses, depots, or honey headquarters in every city, so that, when we have honey to sell, we should have a place to put it. Let me illustrate this: I am supposed to be writing this in Colorado; but I am really writing it in Iowa. Well, Iowa is a corn, hog, and cattle country. There are here always corn, hogs, and cattle; and since these things are always here, and in abundance, there are always places to market them. Buyers ride the country hunting up the products. In Colorado, where I live, wheat is the main product, and hogs are scarce. Well, Colorado has its wheat-elevators everywhere, so there is always

a place to put wheat: but if you want to market a hog you must hunt a buyer. Now don't you see the point? Our honey is always hunting a market, like the Colorado hog.

□ Since, then, we do not produce in quantities that will cause the market to come to us, we must take measures to help it to come. We can organize in some way that we may have market-places that take our honey, put it into suitable shape, and find customers. There is all the work of "introducing our goods," that the small producer can not do; but if it were packed in regular cases and weights, so that the traveling salesmen can represent the goods and take orders just as they do for other lines, honey might be sold so as to make a demand that we know nothing about now. □ Thousands upon thousands who never eat honey would do so if it were to be had as conveniently as maple syrup. I see no reason why honey may not be put up in cheap cans as fruit is now put up. Put up in this way it might go into the homes of the poor people who never see honey. □ We have been working the fancy trade by the use of glass and other expensive packages at such prices that it must be a luxury, while the poor people and laborers have been left out.

There is yet the question of honey candying, local markets, etc., that will receive attention in our next article.

Loveland, Col.

[This, I am free to say, is one of the best articles we have received this season. It discusses this very important subject of marketing extracted honey, not in the old stereotyped ways, but on lines that are both sensible and feasible, and I hope every reader will take pains to peruse it carefully.]

Before discussing some of the points, I would state that friend Aikin, either because of error in figuring or because he had got hold of an old catalog, has put the price of retail honey-packages too high. The Pouder and Muth jars, in lots of 100, cost a little over 3 cts., instead of 4, as Mr. A. has it. Then there are some other reductions that should be made on the other figures. Square cans, in ten-box lots, cost about $\frac{1}{2}$ cent per lb., for the honey, not including freight, and the same can be shipped from Chicago, St. Louis, or New Orleans. Two-thirds of a cent per lb., including the freight from a locality in Central Colorado, would not be very far from correct. But very few would have to pay such freight.

I grant that the self-sealing honey-packages seem rather expensive; but they are designed for a fancy city trade. Some of the self-sealing devices are patented, and that makes the packages expensive. Perhaps the most popular honey-package is the Mason jar. The 3 lb. size (1 quart) in gross lots, costs about $1\frac{1}{4}$ cts. per lb., and the consumer rarely objects to the expense of this jar, because it has an intrinsic value in every household. In the case of any other package, with the possible exception of the jelly-tumblers, the package itself is of no particular value after the honey is out of it.

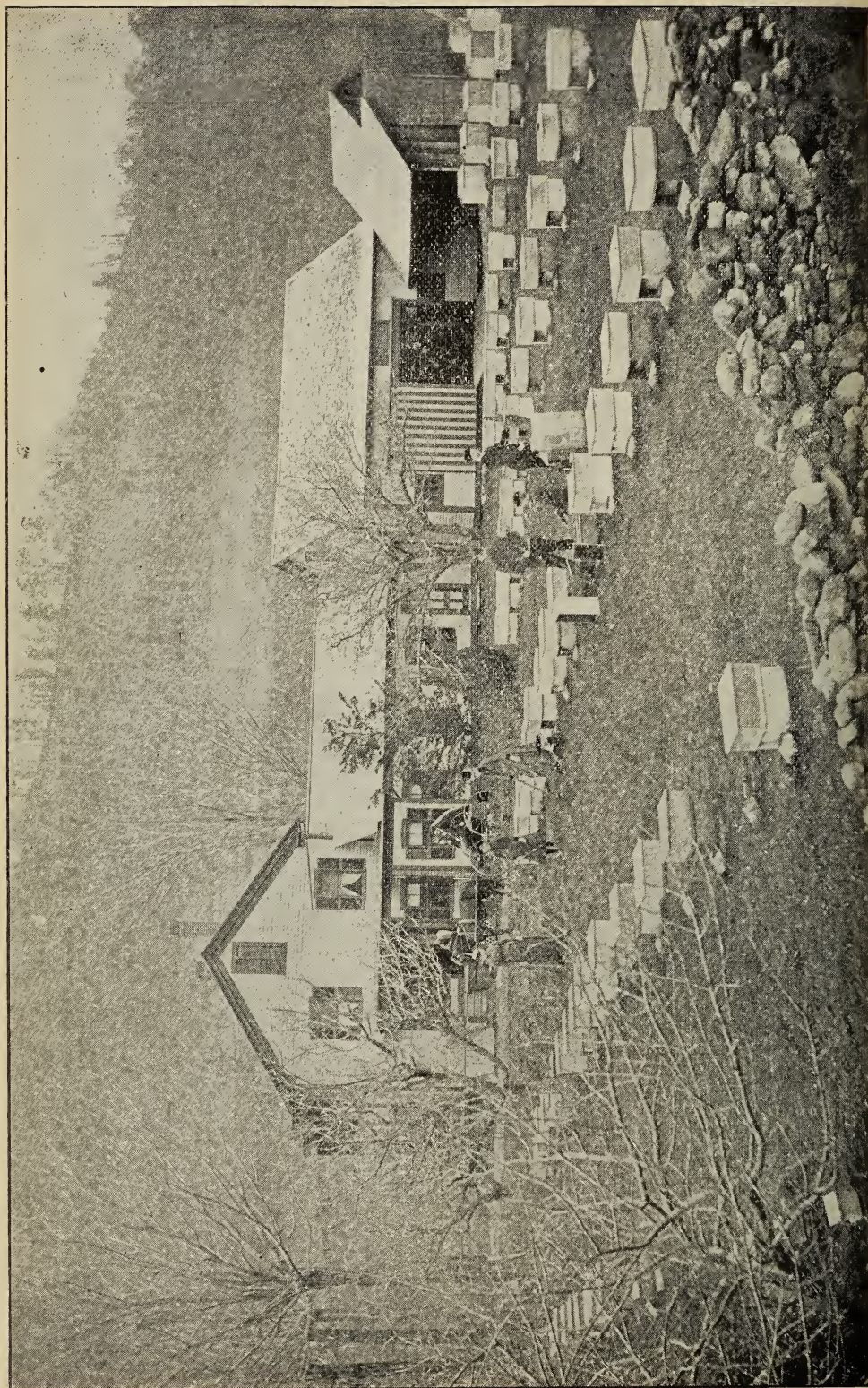
I have said that self-sealing devices made the ordinary screw-top packages expensive. In the case of some, the price is 2 and 3 cts. per lb. Without it, it would be less than half. It has

occurred to me, in view of what Mr. Aikin has said in the last paragraph, that we as bee-keepers ought to make use of some standard tin package, such as is used for canned tomatoes, peaches, etc. Fruit-growers have long since come to the conclusion that a 3-lb. tin can, made of light tin, having the fruit itself soldered in, is the cheapest of any package they could get. This same 3-lb. package would hold about $4\frac{1}{2}$ lbs. of honey, and would cost the bee-keeper, who bought it in a large way, probably not to exceed a cent a pound for the honey they would hold. But, you say, bee-keepers are not skillful enough to solder these fruit cans when filled with honey. Perhaps; but I know a good many who are. We will suppose, for instance, that Mr. A. has bought 500 cans, each can to hold about $4\frac{1}{2}$ lbs. of honey when filled. We will say that he has filled them, and is now ready to have them soldered. I venture to say he can get his tinsmith to solder the whole batch in about one day's time; and the cost ought not to exceed \$2.50, or half a cent a can. Honey put up in this shape can be put up in standard packages; and, when neatly labeled, said label going clear around the can, will compare favorably with any other goods on the markets. They can be tipped upside down, any way, and there will be no danger of leaking. I grant that this idea of tin fruit-cans for honey is not new; but I am of the opinion that it has not received the recognition it deserves.

But it would be no very great trick to do the soldering oneself. Soldering-kits are furnished very cheaply now, and the directions that go with them make the whole thing plain. I have known of a number of instances in California where the bee-keepers soldered all their own square cans.

In Mr. Aikin's last paragraph he touches upon a point that is by no means a visionary scheme. The California Bee-keepers' Exchange is organized, if I am not mistaken, for the very purpose of seeking an outlet for the honey from its members: that is to say, it is to take the annual crops of honey from bee-keepers, in the bulk, and put them in uniform packages of various sizes for the general market. Such a scheme ought to be favorably considered by the bee-keepers of the East; and I believe it would be well for the United States Bee-keepers' Union to discuss the matter at its next meeting.

Let us now consider some of the advantages. One large packing-house, or, if you please, several of them, scattered at strategic points, could buy up the honey from bee-keepers in every direction, in the bulk form. If uniform packages were agreed upon, and this honey were put into such packages, with neat labels, and a guarantee of absolute purity, it would do much to help bee-keepers secure better prices. I know of one large under-buyer who mixes his strong-flavored honey with that which is milder flavored, thus making a honey that is both uniform and pleasant. One honey-buyer mixes alfalfa and strong basswood, and calls it "lincerne." The alfalfa alone sometimes has a flavor that is too mild, and the basswood is sometimes too strong. Combining the two makes a flavor that is just right. You see the point is here: A large packing-house could take the honey from several sections of the country, and combine them in such a way as to make one kind of honey of uniform flavor, and thus it would bring a good price. I do not mean to say that buckwheat should be mixed with clover, but that two or three grades of amber might be mixed, or two or three grades of white honey, and both the white and the amber would be much the better. I hope this question will be thoroughly discussed.—ED.]



THE W. W. CARY AFIARIAN ESTABLISHMENT, COLRAIN, MASS.

W. W. CARY'S APIARY AND BUSINESS.

My father's apiary was established about 1840. Mr. Langstroth was a familiar visitor in my early recollections, and made many experiments with my father when inventing his hive.

My apiary usually contains about 100 full colonies, and in summer is sometimes increased to 300, including nuclei, and has been for 35 years devoted almost exclusively to breeding bees and queens, only a few colonies being run for honey, and these for experimental purposes. My father was the first man to propagate the Italian bee, as you will see by catalog, page 4; also testimonial of Mr. Langstroth, page 45. I have spent considerable money in testing all the different races of bees, and find none but the Italians that seem to fill the bill for all purposes.

I have reared and sold many thousands of queens, and my trade in full and nucleus colonies has amounted to 150 to 200 in a single season.

My mill and storehouses contain over 12,000 ft. of floor space. I have made a specialty of the manufacture of bee-keepers' supplies ever since the invention of the movable-comb system, and have added 2400 sq. ft. of floor space during the past season, including a new room for working wax, 12x50, which is fitted with four foundation-mills and a steam-heater for melting the wax. My father and I bought two of the first mills sent out by A. I. Root, and have used several different machines since. I can not tell you what my annual output of goods is, but will say that it amounts to several thousand dollars annually.

W. W. CARY.

Colrain, Mass.

[Mr. Cary, senior, was one of the old pioneers in American bee culture, and one who did much to help father Langstroth in his apiarian career. Some years ago there appeared in these columns a portrait of him, the biographical sketch having been written by Mr. Langstroth himself.

It was a pleasure to do business with the elder Mr. Cary, as it is now with his son, who like his father has been one of our good customers.—ED.]

SOME SPECIAL TOOLS FOR THE APIARY.

SOME GOOD IDEAS.

By George W. Leonard.

I send you models of some tools that I have been using with much satisfaction. When I sold my farm, and apiary of one hundred colonies of bees, I sold all my tools and bee-fixtures. I send you a sample of foundation that was made on a set of foundation-plates that I made. The die-faces are dipped into melted wax, the same as the sheets for other machines are prepared; consequently the septum is formed when the wax is in a liquid state. That leaves the grain of wax in a compact state. When the bees draw the foundation out, it does not

expand and bulge as foundation does that is manufactured on machines where it is pressed into shape while in a cold or plastic state. This leaves the grain of the wax in a crumbled form. The bees do not tear it down when not in use.

In making this foundation I use three plates, one of which is engraved on both sides, and the other two on one side only. The plate engraved on two sides is dipped into melted wax, then taken out and quickly laid squarely on one of the other plates, and the third plate is laid on top. The three plates, with the two intervening films of wax, are then run between rolls, the same as in other machines, except that the rolls are not engraved. I then plunge the die-plates into cold water, trim off the edges, and strip off the two sheets of foundation. The plates do not require any lubricant—nothing but pure soft water. Alkali in hard water cuts the wax and makes it sticky. If one wishes to wire the foundation he should wind the wire around the middle plate before it is dipped. I used that machine fifteen years, and made thousands of foundation sheets on it, and it was good when I sold it.

CENTRIFUGAL COMB-FILLER FEEDER.

The model will speak for itself (see Fig. 1). The quantity of honey put into the reservoir regulates the quantity that is put into the

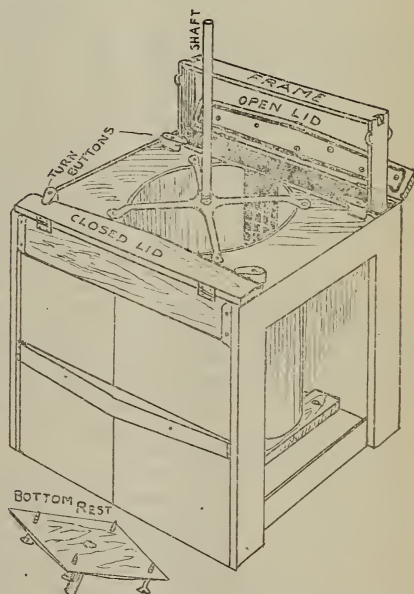


FIG. 1.

combs. To fill the combs full, the reservoir must be two-thirds full. If it is wished to have a large brood-chamber left, fill one-third full. A few turns of the crank of extractor will fill one side. Then open the lids, and with the pliers reverse the combs, and turn as before. Next take out and set over something to drip.

Put sticks between to prevent their touching, or it will form a siphon and the honey will run out. If the honey is blood-warm the machine can be worked much faster.



FIG. 2.

The pliers (see Fig. 2) are forged out of Bessemer steel. The wide handle is made for scraping propolis and burr-combs. When dull, file square across the edges. The spurs on the inside of the handles are made for lifting sections and drawing separators out of the hives.

QUEEN AND DRONE TRAP.

I use mica springs for the escape. These being transparent, the bees make more effort to get through than when metal springs are used. Some twenty-six years ago I used metal springs. When you wish the queen to return into the hive, draw out the mica slide that covers the escape, $\frac{1}{4}$ inch or more. The only objection to mica springs is, that some swarms will nick off the edges until they ruin the springs.

BELLOWS SMOKER.

I did not send a complete smoker, but only the lower part of the barrel (Fig. 4), to represent the double-action mica valve; also a mica valve for the bellows, on a piece of board (see Fig. 5), to represent its attachment to the outside of the bellows, where it can be easily removed when it



FIG. 4.

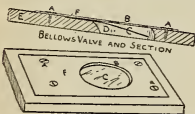


FIG. 5.

needs repairing. I find mica the best material for valves. It is light, and prompt in action, and not apt to get out of order. When you blow with the bellows it presses the valve against the draft-tube (see Fig. 4), and that forces the air out of the nozzle. When you stop blowing, the valve springs back and closes the tube connecting the barrel to the bellows, which prevents the smoke and cinders from going into the bellows.

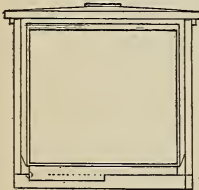


FIG. 6.

I have for a number of years been using an automatic-spacing reversible-frame hive (see Fig. 1). Fig. 6 shows the position of the frames in the package.

The wooden tweezers (Fig. 7) are for picking queens out of the cluster of bees, by the wings. Queens should never be touched with the



FIG. 7.

fingers when it can be avoided. Scent of the fingers causes the bees to ball the queen.

Central Valley, N. Y., Feb. 5.

[Frame-pliers will never become very popular with practical bee-keepers. The bare fingers with perhaps a screwdriver is all that is needed to loosen frames and handle them properly.]

The smoker-valve arrangement is quite ingenious, and there may be something in it. We purpose trying it in a sample smoker; and if it works I will report regarding it further.

There may be cases where queen-tweezers may be an advantage, but in my hands I should be more afraid of pinching the queen. The ends of the fingers are about as good as any thing that can be used, at least by the average queen-breeder.

The idea of filling empty combs by centrifugal force in the same way that we extract them is feasible; but any thing that the bees can do for us can be done by them far cheaper. I should prefer to let the bees take the syrup from feeders and put it in the combs. It is a rule in plowing to save the man and make the horses do the work as far as possible. The same should be true of the bee-keeper and his bees.—ED.]

THE USE OF SWARMERS.

THEIR ADVANTAGES AND DISADVANTAGES; HOW TO CONSTRUCT ONE.

By A. Getaz.

Every once in a while somebody asks me if non-swarmers could be used to any advantage when the apiarist can not be at the apiary every day. If the apiarist can be there twice a week, or at intervals of not more than three or four days, a queen-trap will do as well as a non-swarmers; or even an entrance-guard will do. With the trap there is the advantage of finding the queen there, and also the dead drones, which would obstruct the entrance-guard more or less.

In using an entrance-guard it is necessary that the hive proper should have an entrance the full width of the hive, and at least $1\frac{1}{2}$ in. high. The guard should be not less than 2 in. off the entrance, full width of the hive, and four or five inches high. All this is in order that the ventilation be not obstructed. All this applies also to swarmers and queen-traps.

If, notwithstanding, the colony is too hot, the best way is to add one or two or even more empty supers on the top, enough to bring the temperature down to the proper point. These supers may have sections, or be without them if necessary.

Under no circumstances whatever have any opening above the entrance in order to have better ventilation. In warm weather, when the outside temperature is nearly as high as the inside, they are almost useless, as they ventilate only on account of the difference. On the other hand, during the night and the cool days they create a draft which, under such circumstances, is a positive damage to the colony, es-

pecially concerning comb-building in the sections. If the apiarist can be there but once a week or less, then a swarmer or non-swarmer or self-hiver, or whatever name you may call the apparatus by, is better than a queen-trap.

After trying all sorts of contrivances imaginable during several years, the only kind I can recommend is something like a queen-trap with the upper part large enough to admit two or three combs. These need not be full size, except for convenience. The lower part of the upper apartment in front of the cones must be of perforated zinc, partly to allow the bees to go in and out, partly because the cones must be where the light strikes them. Neither queen nor drone will go up a cone placed in the dark.

Well, a swarm issues. The old queen goes up into the swarmer. There she will remain with a certain number of bees, and go to work. The bees of the brood-nest, relieved of the quarrelling between queen and queen-cells, or, rather, their attempt to protect the queen-cells against the queen, will also do good work until a young queen emerges. Then the racket starts again; the young queen comes out with a swarm, gets into the swarmer, and kills the old queen. The others follow until there is but one left in the swarmer and one in the brood-nest. This last comes out to mate, and meets the other in the swarmer, and then there is but one left in the swarmer. By that time the apiarist must be on hand, and permit the last queen to mate. Further delay would practically ruin the colony.

When the apiarist comes he will probably find some that have just swarmed, and some that have swarmed or have been repeatedly swarming.

If the old queen is yet in the swarmer, the colony can be divided. If no increase is desired it is necessary to prevent further swarming, to destroy or remove the old queen, and allow requeening. It is not absolutely necessary to destroy all the queen-cells, but yet it is better to do so, except, of course, one or two. At the next visit, only one queen will be there, probably in the swarmer, no brood young enough to raise more queens, and possibly some of the last queen-cells constructed. These can be destroyed, and the young queen allowed to mate.

If a young queen is present, destroy all the remaining cells and let her mate. There is no danger of more swarming if the brood is all capped or too old to raise more queens; and I think there is very little danger, if any, even with young brood, destroyed cells, and a virgin queen; still, I am not positively sure. At any rate, requeening as described above will end the swarming for that year, provided enough room is given in the surplus apartment, even if the brood-nest is not larger than 8 L. frames.

If, instead of allowing the colony to requeen, the apiarist will introduce a young laying queen, it will be necessary to wait until the

bees have been two or three days with no uncapped brood. The nurse-bees have not then taken to the field, and there will not be enough of them to construct more queen-cells after the young queen begins to lay.

Two points need consideration here:

Dr. Miller says the perforated zinc will not prevent the queen from going out with the swarm. Well, my experience disagrees completely with his. I have had but one case where I *think* the queen went through the zinc; but in all the other cases where the queens were missing with the swarm I found some crack somewhere, generally in the most unsuspected places. The queen will remain in a swarmer; but with a queen-trap she will eventually (in the course of two or three days) find her way back through the cone; and if she is then killed by a young queen the apiarist may think that she has escaped through the zinc.

Another drawback is this: It may happen that, when a young queen goes to mate, a swarm comes out from another hive, joins the young queen, and the whole outfit goes to the woods, but not often. I once had a young queen that brought the swarm to her own hive. In fact, the young queen will often return to her hive without paying any attention to the flying queenless swarm; yet a few may be lost that way.

The only way I know of to prevent such loss absolutely is for the apiarist to let the young queens mate only when he is present. After a young queen has tried several days to go out, and failed, she is very keen to do it; and if, after one or two o'clock in the afternoon, the apiarist opens the zinc, she will, in nearly every case, mate at once. Should a swarm issue at that time, the apiarist being there could take care of it.

Knoxville, Tenn.

HEATING A BEE-CELLAR ARTIFICIALLY.

OIL-STOVES NOT SATISFACTORY.

By G. C. Greiner.

The closing sentence of Dr. Miller's answer to Mr. Fred B. Cavanagh's inquiry, "Better warm it up some way," is exactly what I should want to do if the temperature of my cellar averaged as low as 35 to 38 degrees; but the question is, "How?"

Years ago I had the same trouble. My cellar was not at that time filled to its full capacity, perhaps not more than one-half or one-third the number of colonies it would accommodate, allowing about 15 cubic feet to the colony. Besides, it had not the outside protection it now has. I mistrusted that, through the colder part of winter, artificial heat would be necessary, and planned to use an oil-stove in the entry.

The latter was a four-foot room, divided by an air-tight partition from the cellar proper. As I had had some experience with oil-stoves before that, I was well aware of the fact that one could not be used in a bee-cellar without being more or less detrimental to the comfort of the bees on account of obnoxious gases and befouling the air. For this reason I took special pains to make the partition air-tight (as I thought), and provided, as an additional safeguard, an extra ventilator, 6 inches square, right over the place which the oil-stove was to occupy.

When the temperature went down to 38 degrees, after it had stood at about 42 the fore part of winter, I lit the stove, which was well trimmed and filled, and the blaze was turned up to where it would give, according to directions, the most perfect combustion, and leave no smell in the room. After six hours (the time that amount of oil is calculated to run the stove) I went to see the effect. On opening the door I found the little room dark, quite warm, and with an offensive oil smell. As the stove went out on account of the oil burning out, I gave the dying blaze the credit of the bad odor, and decided that, thereafter, I would either refill the stove or turn it out before it would have another chance to die a natural death.

The next time I entered the cellar after I had the stove started again, it was still burning at full blaze, but, to my surprise, the disagreeable smell was the same. The bees seemed to be equally displeased. On listening I could hear their roaring through the partition—a decided increase over their natural quiet hum when not disturbed.

Further investigation showed a rise of temperature of 2 degrees in the further end of the cellar, where the thermometer is placed. Now, whether this rise of temperature was caused by the heat of the stove alone, or whether the excitement of the bees had something to do with it, I am not certain; but I am inclined to think it had. The oil scent had also penetrated the partition, and, undoubtedly, disturbed the bees more than the rise of temperature. I agree with Dr. Miller and the A B C, that stoves in the cellar have done more harm than good.

Since making the above observations I have made but very little use of oil-stoves for that purpose; neither have I tried wood-stoves or boiling water; in fact, I do not need either since finding, by experience, better, cheaper, and safer means for keeping my cellar at the desired temperature. First, better outside protection; and, second, filling the cellar to its full capacity, or, if the necessary number of colonies is not available, reducing the size of the cellar. By these means my cellar maintains an average temperature of about 45 degrees, with a variation of not more than one or two degrees either way.

Naples, N. Y.

[While the A B C does not exactly recommend artificial heat for bee-cellars Dr. Miller certainly does if the temperature goes too low; but he uses a small hard-coal stove in the bee-cellar itself, and of course there are no odors because the products of combustion go up the chimney. Oil-stoves, I know, he would not use. A common stove carries away the foul air at the bottom of the cellar, starts the good air circulating, and raises the temperature.—Ed.]



PREVENTION OF AFTER-SWARMS.

Question.—I wish you would tell us in GLEANINGS how to prevent after-swarming. I know you have written on the subject before, but I can not now turn to it; besides, I wish you to go into the minutiae of the matter so that "a wayfaring man though a fool need not err therein." Last year I thought I could stop such swarms; but I failed, hence appeal to you. Please give the matter your attention in the first issue for June, as my bees commence swarming about that time.

Answer.—There are various methods of preventing-swarms, such as removing the old colony to a new stand as soon as the swarm has left it; setting the hive containing the new swarm on the stand it previously occupied; cutting off all of the queen-cells but one on the fifth or sixth day after the first swarm issued; hiving the after-swarms in a box on top of the old hive till the next morning after they came out, when they are to be shaken out of the box in front of the old hive, and allowed to run in, so that the young queens will, all but one, be destroyed, etc. Each of these plans has its various advocates. I have tried them all, besides many others put before the public, and not so given; and, after trying the many, have settled down on the two following as being the cream of the whole. I have used these plans with success for years, and use them in accord with what I wish to do with the old colony.

The first is used only where the old hive is carried to a new stand while the swarm is in the air, on the principle of using the new swarm for the main dependence for comb honey, hiving the new swarm on the old stand. To accomplish what I desire, I proceed as follows:

As soon as the swarm is seen issuing from any hive I go to the shop where I get a box or hive used for carrying combs, which has previously been prepared, having the desired number of frames in it, either filled with combs or comb foundation, taking it to the hive from which the swarm came, when the frames are set out of the box near the hive. I now take off the super and take out the frames of brood, putting them into the box. If the combs of brood

seem to be well covered with bees, and the weather is warm, I shake a part of them off in front of the hive before putting the combs into the box. If few bees or cool weather, I put all into the box, setting the box in the shade, and a rod or so from the hive, as soon as all of the frames of brood and bees on them are in the box.

I now put the frames brought from the shop into the hive and rearrange it, by which time the swarm will return, if the queen has a clipped wing. If the queen is not clipped, then the swarm is to be hived in this prepared hive on the old stand, the same as any swarm is hived. I next put the combs of brood and bees which are in the box into a hive where I wish the colony to stand, and adjust the entrance to suit their wants, when they are left till the next morning. By this time nearly all of the old or field bees have gone back to their old location, so that the young bees which remain are ready to accept any thing in the shape of a queen.

I now go to my queen-nursery, where I generally have on hand virgin queens just hatched (or if I do not have these I get a ripe queen-cell), and select such a queen as I wish them to have, place her in a wire-cloth cage, and take her to this hive. Upon opening the hive I take out one of the central combs, holding the same up before me. As the bees are all young they will at once take to filling themselves with honey; and while they are so doing I let the queen run on the comb where there are a few cells of honey not occupied with other bees filling out of them, when the queen will commence to fill herself the same as she sees the others doing.

The frame is now lowered down into the hive, and the hive closed. In this way the bees and queen appear natural, and I have yet to lose the first queen put in under such circumstances.

As the bees now find they have a queen, they proceed at once to destroy all of their own queen-cells, so that no after-swarm ever issues—at least an experience covering 15 years says that none do.

The other plan which I use is fully as successful as the above, but is used where I wish to treat swarms the way they are generally treated by hiving them on a new stand, in which case I proceed as follows:

As soon as the swarm is hived I go to the old hive from which it came, and mark on it with a pencil, "Sw'd, 6-10," which tells me at a glance that a swarm came from that hive June 10, should that be the date on which the swarm issued, and the one which was marked on the hive. If it should be another day the date is different; but the plan is the same, and suited to any day on which any first swarm is cast. On the evening of the eighth day from the date on the hive I listen a moment at the side of the

old hive; and if swarming has been "according to rule" I hear the young queen piping, when I know that a queen has hatched, and an after-swarm will be the result if not stopped. If no piping is heard I do not listen again till the evening of the 13th day; for the next rule is that the colony swarmed upon an egg or small larva being in the queen-cell, which allows the queen to hatch from the 12th to the 16th day after the first swarm. If no piping is heard by the evening of the 17th day no swarm need be expected. With cool weather and a failure of nectar very few after-swarms issue, or none at all; but with continued good weather and honey-flow, scarcely a colony will fail to try for after-swarming so that, with the bad weather, it is hardly worth while to listen at all. In nine cases out of ten, if the colony intends to swarm, the piping will be heard on the eighth day after the first swarm is cast, so that this listening is no tedious job, for not more than a moment is generally required at any hive. When it is heard, I go early the next morning and take every frame out of the hive, shaking the bees off from each (in front of the entrance) as I take them out, and return them again, so I may be sure not to miss a queen-cell, but cut all off, for we know that there is a queen hatched from the piping which we have heard. Once in a great while the bees will take a notion to go with the queen when she goes out to be fertilized, but such an occurrence is rare, and has nothing to do with what is known as after-swarming.

In the above two we have sure plans for accomplishing what we desire, under all circumstances which may arise, while those spoken of at first will work at times and at others not. The sure plan is to be preferred in the end, though it may take a little more time when doing it.



PROTECTING THE APIARY FROM THIEVES BY
AN ELECTRIC ALARM.

I wish to protect my bees from thieves, with an electrical bell, such as you describe on page 266, 1895, but "I don't know" the first thing about putting up the wires. I might fasten them so the current would be grounded, or lose all of its strength before reaching the bell. Will a home-made battery, such as you use for wiring frames (described on page 105, 1895), answer? Does it need three batteries? Will an ordinary door-bell ring loud and long enough to wake a sound sleeper? I can get an electric door-bell for 75 cts. of Montgomery Ward & Co., Chicago; a battery for 50 cts., or the whole outfit for \$1.75, including 100 feet of insulated

wire, etc.; but this is simply a door-bell, and I don't know whether it is the right outfit or not.

There is a gang of wild boys here who take delight in robbing bees—not only mine, but all over the neighborhood. They took about \$3.00 worth of nice white comb honey from one hive last year, and held a grand pow-wow on the corners. I saw honey and wads of wax there the next morning; found out who was there, got the sheriff on track of them, but they denied having any honey or any knowledge of it. I could not prove it in court, or, at least, the prosecuting attorney thought so. No arrests were made, but the sheriff told me he knew I was on the right track, for they all showed guilt when questioned. I have lost honey every year. Sometimes they destroy the whole hive, and I am getting sick of it. I always give them all they want to eat, but there is no "fun" about it then. They like the fun of "cooning" it. I can't work hard all day and watch every night, so I wish to try some kind of alarm to wake me.

H. L. HUTCHINSON.

Mayville, Mich.

[The battery described in GLEANINGS, page 206, current volume, would hardly be suitable for an electric alarm; that is, it would be too strong and too expensive. The one that you mention, which you can get of Montgomery Ward & Co., including battery, door-bell, and insulated wire, is just about the thing, and the price is very reasonable. The bell should be stationed in your bedroom, and the two wires should attach the bell to a point outside the house. The bell and battery may be in the same room. Directions which go with the outfit would show you how to arrange the bell and battery, so there will be no trouble along that score. But very little wire will be needed. The spool of linen thread, mentioned on page 266, 1895, should be long enough to go clear around the apiary, or the space of ground that you wish to protect from depredations of thieves. As there explained, the thread should pass through eyelets fastened to trees or posts, and should be low enough, say about two feet from the ground, so as not to be seen by those who go into the apiary. As there explained, one end of the thread is made fast, and the other end fastened to a wooden plug that separates the two brass springs forming the two poles of the battery, as explained in our journal, 1895. By following directions there given, together with the directions that go with the battery outfit from Montgomery Ward & Co., I think you will be able to make the thing work all right.—ED.]

QUEEN-BEES IN THE MAILS; SLIPSHOD QUEEN-BREEDERS.

The monthly Postal Guide for May is before me, and I see in the classification of mail matter that queen-bees are mentioned as admissible when *properly packed*, and this is a matter I think you ought to call the brethren to in big words of warning. Have a notice in every journal, and ask the other journals to do likewise. It is a serious matter, and one that needs attention. A few years ago I was going to write you, but neglected to. I got a queen, sent

me from a queen-breeder, in a second-hand cage. The candy was put into the wrong end of the cage; and in place of the cork he used a piece of corn-stalk. It must have dried out, or was too small when put in; anyhow, when I took the cage out of the mail-bag, the queen was nearly out. I just said then I wouldn't have had those bees get out in the mail for a dozen such queens.

C. M. HICKS.

Hicksville, Md.

[I am glad you have called attention to this matter, friend Hicks. We can not afford to lose the valuable privilege we now have of sending queens in the mails, by such carelessness on the part of queen-breeders. If there are any queen-breeders who put their queens up in any such manner as above explained, send us the particulars.—ED.]

HOW BEES CHOOSE A LOCATION SOMETIMES, PREPARATORY TO SWARMING.

On page 293 of the A B C book you say that bees choose a location *sometimes* before swarming. This I know to be true. To-day it was verified. Yesterday, when I returned to the ranch, my brother told me that there was a lot of bees out in the wagon-shed. Going there to see what the matter was I found probably a hundred bees buzzing excitedly around some empty hives that I had tiered up. By dark all had disappeared. This morning I closed the entrance to all but one, the highest, and in the front tier I prepared it with frames of foundation, and left it. This afternoon the hive was taken possession of by a strong colony of black bees. They are not from my own apiary, half a mile away, as I have only Italians and hybrids.

JOHN M. FRANCE.

Moreno, Cal.

BOARDMAN EXTRACTOR AND OLD COMBS.

Does the Boardman solar extractor take out the wax of old combs near enough so that the refuse is not worth while fussing with, even with sulphuric acid?

GUSTAVE GROSS.

Milford, Wis.

[The Boardman wax-extractor, if used properly, will get almost every particle of wax out of old combs; but the old stuff needs to be stirred occasionally so as to let the wax out of the refuse. It may take a week, however, for all the wax to run out. The stuff that remains is hardly worth fussing with.—ED.]

WEED DRAWN FOUNDATION.

A step in the right direction has been taken by our American cousins in the manufacture and introduction of the new "Weed" foundation, which must necessarily mean a saving of time and labor to the industrious insects; and experience has taught us that, where drawn comb is used, bees commence work much sooner. The "Weed" foundation will be especially useful in comb-honey production.—R. HAMLYN-HARRIS, Bristol, Eng., in *British Bee Journal*, March 18.



J. M., Fla.—We should be glad to hear from you further in regard to how you cured bee-paralysis; but, as you know, this disease very often goes away itself, and comes back again in some mysterious way which no one can explain. We should be very much inclined to question whether you have a remedy which is infallible.

G. W. M., Pa.—It is the usual rule among some honey-producers to kill all queens over two years old, as it has been found more profitable to do so. Young queens are more prolific, and consequently the colonies are stronger, and strong colonies mean honey; but where a queen-breeder has a valuable queen as a breeder, it is usual to keep her just as long as she will live, as her daughters of the last year are just as good as the daughters raised during the first year.

C. H. P., Neb.—We can not explain why the bees should be robbing the colony if, as you say, it is strong and the entrance contracted so that only two or three bees can pass at a time. Possibly they are black bees. Such bees usually do not make a very good defense. If you can put in a frame of hatching brood from a pure Italian queen, shortly after the young Italians hatch out, they will begin to defend the entrance. Italian bees are very much better than black or hybrid for defense.

M. D., Ohio.—It will be a good plan to cut out all queen-cells just before swarming-time, before putting on the supers. Some cage their queens at that time and then cut out the cells again. This effectually prevents swarming, and at the same time puts the bees into that condition where they will keep on storing honey in the supers. If the bees swarm out from under the super, you can take the queen out, as you suggest, or you can cage her; but you will need to cut out the cells in about eight or nine days, otherwise they will swarm out as soon as one of these cells hatches. To make sure that you miss no cells, shake the bees all off the combs, and then scan them very carefully, destroying all cells that you discover.

C. H., Minn.—It is quite a common practice to hive two swarms in one hive, especially if both are not quite as strong as the average. Of course, one of the two queens will be killed. It very often happens during swarming time that several swarms will come out at once, and then when they cluster together in one place it is the practice to take out enough to make one swarm and put them into a hive, and then another, and so on until there are as many swarms as

originally came out into the air. When they unite in this way there is no fighting; but there is a liability of there being a loss of some of the queens, owing to the fact that one or more queens may get into one bunch of bees and be put into the same hive.

C. P., Ariz.—The only satisfactory way to disinfect hives in which there has been foul brood is to immerse them in boiling water and keep them there for a few seconds. Some have advocated smearing the inside of the hive with kerosene, and then touching a match to it, and letting the fire char the inside out; but this blackens and disfigures the inside of the hive. For further particulars regarding foul brood, see the article under that head in our A B C book.

C. R. B., O.—Twenty-five colonies of bees at \$1.00 apiece is very low, and I do not see why it would not be a good bargain for you to take up with—that is, providing you have had experience, as you say you have. You will find very full particulars in regard to shipping bees under the head of "Moving Bees," in the A B C book, which you have just purchased. The frames or combs in the hives should be held securely in position by sticking up, if they are not already fast. It is best to remove the cover of the hive and tack mosquito-netting over the top, or, better yet, wire cloth. The entrance should be closed. The hives themselves should be set upon loose straw in the bottom of the car, with the frames running parallel with the rails of the track. If they are crosswise there is a liability of the combs breaking out when the car bumps against another.

M. B., Texas.—Referring to the short method of transferring, as given in our catalog and our A B C book, I would state that queen-cells, of course, will start in the old hive having the remnant of bees to take care of the brood. If you wish to prevent these from making any trouble at the last shaking out, in about eight days drum the bees out again, cut out the comb, and then destroy what cells may be built. These loose pieces of comb you can put on top of the colony that has been transferred and is in the new hive. When the brood hatches out, remove these pieces of comb and render them into wax; but it will do no harm, ordinarily, to let the cells be completed and hatch out young queens. At the end of three weeks, in this case, drum all the bees out; and if there are any young queens they will go into the new hive. Either the old queen and bees will kill the young queens or else one of the young queens will supersede the old queen. In either case the result will be that only one will be left, all the others being destroyed. When colonies are transferred from *box* hives, the probabilities are that the bees will be blacks or hybrids, and the young queens would not be very valuable.



It seemed very peculiar to Fred to address Alfaretta as Miss Buell, and to be addressed by her as

Mr. Anderson; and, though the familiar face was before him, they were, under the new reign of reason, strangers. Then her voice, her eyes, her general bearing, betokened a sensible young woman. Showing signs of fatigue, Fred persuaded her to retire again to the cabin, and rest, assuring her that the separation from her parents should be looked upon as a providential occurrence; for, had she never been separated from her parents in this strange way, the chances were that she never would have recovered. Now in a few weeks she could return, and surprise her people by the recovery from her terrible malady.

When Alfaretta had entered the cabin, Fred strolled down to the little grove of oaks, and there, an hour later, Dr. Hayden found him in deep thought.

"Fred," said the doctor, "I think I can divine your thoughts. Alfaretta sane is not the young lady she was to you. Remember, all the past must be a blank, and your acquaintance must be renewed from the present."

"Yes," replied Fred, "those were the very thoughts that were occupying my attention. When I thought myself well acquainted with Alfaretta I find that I must commence my acquaintance over again. She is so different that I hardly know how to act in her presence."

"I see," said the doctor. "In her evident desire to seek you, and to be near you, you have allowed your sentiments to get the best of you."

"Compelled, you mean," replied Fred; "who could withstand such loveliness, even though the subject were insane? and now that she is sane, I fear I am unworthy to approach her."

"Ah! well," said the doctor, as he moved toward the cabin, "young people are liable to build air-castles, and tenant them with fairies and angels; but I think you will find Alfaretta very human after all."

The days and weeks sped all too fast for Fred. He applied himself assiduously to the management of the bees; and had he been in any other place he would have avoided Alfaretta; but the narrow confines of the valley made that impossible.

The increase of the apiary was checked, and the energies of the apiary were being prepared

for a honey harvest. The doctor was much worried in getting his supplies; he spent much time with his signal colony, and he learned from the returning bees from day to day that there was danger outside. The disappearance of a girl and boy almost before their eyes led the people outside to use every means to solve the mystery. Even the Indians were abused, and threatened with removal to a reservation in the far south. But the mystery remained unsolved.

As Alfaretta became stronger she longingly looked over the cliffs to the south, and entreated the doctor to allow her to return to her home.

"Why, my dear," the doctor would say, "you are not strong enough to endure the hardships of a horseback journey. When I think you can endure it you shall return."

In her tramps around the valley she became familiar with every portion of it. At first Gimp was her leading chaperon. She realized that she had followed Fred to the valley, and, in consequence, was very reserved toward him; but, being passionately fond of flowers, which passion had never left her, even while insane, and finding many new varieties, she would take them to the doctor for the name; and, though he knew the names, he would send her to Fred. In that way they were thrown much together, against their wills, and finally they were taking many twilight strolls together, or singing songs to the accompaniment of Fred's guitar, with evident pleasure.

"Why, Mr. Anderson," said she, one evening, "I find new beauties here every day."

"That has been my experience," replied Fred; "but there is one beauty you have not investigated yet; you should study the wonders of the bee-hive."

"I fear I have as much abhorrence of them as our colored friend Sam has," she replied.

"Well, you ought not to," said Fred; "for it was the bees that indirectly returned you to health again."

Alfaretta, after much hesitation, consented one day to be veiled and gloved, and then Fred posted her in a safe portion of the apiary, and himself and Gimp entertained their guest for an hour by manipulating the hives before her. From this time she became a constant visitor to the apiary, and, under Fred's kind directions, she soon learned to manipulate a hive herself; and with what pride she related the circumstance to the doctor!

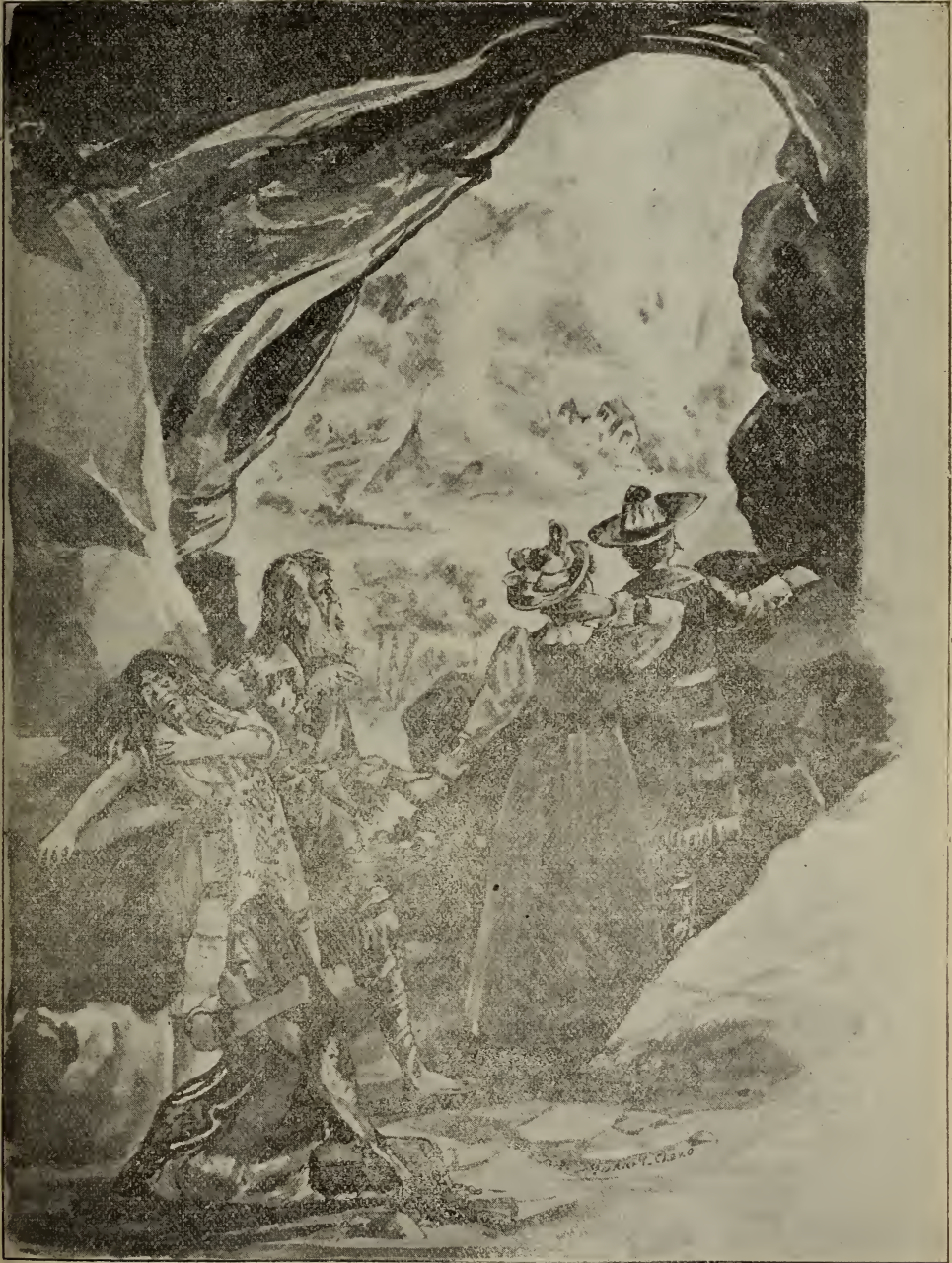
"But didn't you get stung?" said the doctor.

"Why, yes—ha, ha!" she laughingly replied; "a little bee stung me on the finger, and at first I thought Fred was going to kiss the finger; but he changed his mind and stuck a lump of mud on it."

"How could he?" asked the doctor; "but then, mud is a more efficacious remedy for

stings than kisses. I guess Fred was sensible, after all."

So time sped rapidly along. The doctor seemed in no hurry to get rid of his patient. She had been in the valley nearly four months, and springtime had well advanced. One day, as they gathered for their noonday lunch, she



"THERE WAS AN UPLIFTING OF THE ENTIRE VALLEY."

returned from the hot sulphur springs in haste, and said, "Doctor, there is a peculiar phenomenon at the sulphur springs. The spring you call the little geyser has disappeared, and there is a boiling mass of black mud all around it."

"That is peculiar," said the doctor thoughtfully. "That spring has held the even tenor of its way ever since I have lived here. I don't understand such an ebullition. It will bear examination."

Then the doctor and Fred hastened to the springs.

"Surely," said the doctor, "she must be mistaken; there is no chance for mud around those rocks;" but the doctor changed his mind when he looked down upon the familiar place, and an exclamation escaped from the lips of both.

"See," said Fred, in alarm; "that rock on which we had our nucleus colonies has been undermined, and there it goes into the seething mass."

"Yes," said the doctor, "that pit is enlarging; there goes another section of rocks."

A puff of steam now belched from the center; and as the wind blew it toward them they were nearly stifled by sulphur fumes. Another large section of rock and earth sloughed off between them and the abyss, and, after a tremor, sank, and hot steaming mud came uppermost. Fred felt the rock under his feet, and found it hot.

"Doctor," said he, "what does all this mean? We are in danger."

"Oh! no, Fred; this is merely an ebullition of an old crater, and will soon subside."

"Don't flatter yourself too much upon that point, doctor; craters have more back of them than we can imagine. I propose that we seek safety while we may, with the precious lives we have here. There," said Fred, in alarm, "goes an area as large as a garden-patch. Dr. Hayden, this very spot upon which we stand is liable to melt away. Hasten, doctor; we must save Alfaretta."

The doctor was loath to go, but followed Fred, who ran speedily toward the cabin, shouting to Sam and Gimp as he ran. When at the cabin he tried to appear cool, and briefly explained the situation; and when the doctor came up it was decided that they take a few valuables and proceed to the upper terrace, near the entrance. The doctor, from his age and experience, viewed matters very coolly; and when Fred thought the very ground under them might sink at any moment the doctor seemed unconcerned, and was the last to leave the cabin. While they were hastening toward the elevator there was an unusual tremor of the whole valley, and the upheaval of mud was greater than ever. The entire lower end of the valley appeared like a steaming caldron. Every one of the little party was now thoroughly frightened, and, with various exclamations, rushed for the elevator. This frail home-

made apparatus would carry but two persons, and Alfaretta and Alamantapola were sent up first. While the rest were taking their turns under the doctor's directions there were more seismic manifestations. The surging hot mud was engulfing every thing. The doctor's cabin, recently so pleasant with life, had disappeared. The boiling mud became more violent, the fumes mere stifling. The doctor and Fred were the last to leave; and as Fred was stepping from the elevator there was another violent tremor, and the elevator tackling gave way, and the apparatus, with some rock from above, went crashing down. Fred came near falling with it; but the quick hand of Alfaretta saved him. But what a terrible view was before them! The whole of the beautiful valley was breaking up. The little party seemed spell-bound at the fearful scene before them. Fred heaved a deep sigh, and averted his gaze as he saw a portion of the apiary slough off into and under the hot mud.

"All going," said he; "all, all."

"Yes," said the doctor, "all is lost here. We must away;" but in a moment more there were shouts of terror—the passage was closed! The tremors increased in violence. There was an uplifting of the entire valley; hot mud and sulphur fumes were thrown high in the air, and now any moment the little party would be overwhelmed.

The two Indian women commenced the death-chant of their tribe, and all waited for the fatal moment.



WE are trying a smoker having the bellows-boards grooved, as stated on page 372. It adds but a trifle to the expense of the smoker, and is a great convenience to the manipulator of the instrument.

WE have just received two lots of imported queens direct from Italy, from two different breeders, *by mail*, and there was a loss of only 4 out of 24. The success of last season, and this so far, would indicate that we shall not have to resort to the expensive method hereafter of obtaining these queens in little boxes *by express*. But in order to attain success we find it necessary to prepare the cages ourselves, and ship them to the breeders in Italy, with instructions to return queens in them.

W. F. CLARKE seems to rejoice in being a heretic in theology and apiculture and in keeping out of the beaten track. He believes in sugar honey; that the honey-extractor has been on the whole a curse; he would not join

an organization for the special object of prosecuting adulterators, because he believes in producing comb honey exclusively as the best way to meet the adulteration evil.

THE *Nebraska Bee-keeper* has been merged into the *Busy Bee*, with Emerson T. Abbott as editor and proprietor. It is monthly as before, and published at 50 cts. a year. The new series starts out well, for its editor is a practical man of experience. The journal will be devoted to "farm bee-keeping and other minor interests of progressive agriculture." Mr. Abbott is, I believe, employed by the State every fall and winter to deliver a series of lectures on rural subjects at farmers' institutes. If he can throw himself into his paper as he does into his talks his venture will be a success.

In order to give the membership of the United States Bee-keepers' Union a boost we have decided to give GLEANINGS one year, and a membership in the Union for the same length of time, for \$1.75. But in every case the money must be paid in advance; or if there are arrearages, back subscriptions must be paid up to the present, to entitle any one to take advantage of this offer. Or if there are some who feel that they can not afford to pay \$1.75 we offer GLEANINGS the rest of this year to new subscribers, and membership in the Union, both for \$1.35. On this basis you will get seven months' subscription to GLEANINGS for 35 cts.

PREDICTIONS OF FAILURE AND DISASTER.

In referring to the attacks that have been made on deep-cell foundation, the editor of the *Review* says he has "no sympathy with the extravagant predictions of failure and disaster"—italics mine. He further adds that he has no fears except that the new product may be tough and leathery, like foundation; and while he can see no reason why it should not be so, yet "so long as Mr. Root says that the side walls, after being finished, compare favorably with natural comb, I prefer to wait till I can try it myself." GLEANINGS has no fault to find with this. As one other writer has said, "If the new deep-cell foundation is a good thing it will go; and if it is not, it will not be heard of long." And I may add, malicious attacks to push it down will and have had the opposite effect, for very often the best way to help along a thing is to fight it tooth and nail.

OTHER MACHINES FOR MAKING CONTINUOUS WAX SHEETS.

SINCE the advent of the new Weed continuous-sheeting machinery, it would appear that two or three others are trying to make machines for making continuous sheets. One party employs a large wooden wheel, the rim of which revolves in a vat of melted wax. While continuous sheets can be made in this way,

and have been so made for years, they are nothing but dipped sheets, or what we now style "old-process wax." We have seen samples of wax sheets made in one of these machines, and they are identically the same in texture and quality as the old dipped sheets. The Weed sheeting machine not only turns out continuous sheets, but produces a wax of superior texture and quality—tough, pliable, and translucent.

MARKETING HONEY.

AFTER preparing the footnote to Mr. Alkin's article, found in another column, the *Bee-keepers' Review* for May comes to hand containing an editorial something in the same line on the Fruit-growers' Union. After mentioning the fact that the California Bee-keepers' Exchange expects to work in coöperation with it, the editor goes on to explain the working of the Fruit-growers' Union. This is what he has to say:

To their sorrow, many growers of perishable fruit, like berries, tomatoes, peaches, and the like, know that a glut in some market so reduces prices that the fruit does not sell for enough to pay the freight and commission. At the same time, within less than 200 miles, the same kinds of fruit may be selling at good prices. The trouble is not that too many strawberries are raised, but that the distribution is unequal. They are often massed in a few points. The grower writes to the commission man, and receives a favorable reply. He ships his fruit; but hundreds of growers have done the same thing. The tendency is to ship to central points like Chicago or Cincinnati, and neglect the smaller towns. The great object of the Fruit-growers' Union is to prevent this massing of products. It has agents scattered all over the United States, and these agents are constantly reporting to headquarters the condition of their respective markets. In the case of perishable products, or whenever the case demands, the telegraph is freely used. Reports are also constantly being received in season regarding the condition of the crops. The General Manager knows, for instance, all through the strawberry season, where the berries are being grown, when they are ripening, how they are being "turning out," etc. He also knows where they are being sent, and is promptly notified if there is any tendency towards a glut in the market, or if any market is needing more berries than it is receiving. When a grower is ready to ship, he notifies headquarters by telegraph, saying how many berries he has, and is at once notified by telegraph where to send his berries. The Union has absolute control of the product of its members; and so closely are the markets watched that a shipment is often diverted after it has been started. For instance, it started for Chicago; but while on its way, notice is received that there is a glut in Chicago, while Jackson, Mich., is "short." By means of the telegraph the shipment that started for Chicago has its route changed to Jackson.

Ten per cent of the proceeds is retained as commission; but at the end of the year (I think it is), if it has not cost ten per cent, then there is a rebate. In other words, a member has to pay only what it actually costs to sell his product, and he has the satisfaction of knowing that his product has been sold in what was, in all probability, the best possible market he could have reached.

That one central organization such as the Union is able to prevent a glut in any particular market, for the very reason that it has facilities for surveying the whole field at once, even calling to its aid the telegraph, is a big fact. It is high time that bee-keepers were keeping up with the fruit-growers; and GLEANINGS will cheerfully give space to a thorough discussion of the matter.

THE THREE STAGES OF AN INVENTION.

AN eminent judge has said that nearly every successful invention has to pass through three stages. First, the invention can never be made a practical possibility; it had better be let alone. Second, when its practical success is assured, "nobody wants it—it will work harm rather than good." Third, after it has passed these two stages, and it is shown to be a good idea, and everybody wants it, then the cry is raised, "It is old; it was in use before; it is common property." The new Weed drawn foundation has now passed the first and second stages. First it was said that foundation with deep cell walls as thin as or nearly as thin as natural comb could not be made; but now that it can be made, it is argued that it will be "ruinous to the industry." If history repeats itself we may soon expect the third stage.

TAMING APIS DORSATA AND SEMINOLE INDIANS.

THE following note, received from Mrs. Harrison, will explain itself:

Mr. Editor:—I hope you will succeed in introducing *Apis dorsata* into this country. You appeared to think I was poking fun when I recommended turning them loose in the everglades of Florida, among the Seminoles. The everglades are like lakes dotted with small islands, covered with a semi-tropical vegetation. Wouldn't dorsata feel more at home there, in that warm climate, with its large flora, than in Medina, Ohio?

If you ever succeed in getting them alive to this country, take a few of them to Biscayne Bay, Miami, or Fort Myers. You could put in your winters in taming them and the Seminoles together, and tell us all about them. Teach the Indian children on Sunday, and dorsata to live in a hive on week days. You might succeed in making the price of honey and wax so low that the adulterators will have to take to the woods.

Peoria, Ill.

MRS. L. HARRISON.

If we succeed in getting these bees over to this country we will send our Mr. Root senior down to Florida to see what he can do to tame *Apis dorsata* and the Indian children in that far Southland.

CORK SOLES FOR USE IN THE APIARY.

FOR a few months past I have been wearing thick cork soles on my shoes. Instead of finding them clumsy, as I feared they would be, they are the easiest shoes I ever wore, and, moreover, they seem to be proof against wet and damp sidewalks. Usually, when going out into the apiary with thin-soled shoes, in walking in damp places the soles would get soaked through, and the result would be damp feet. This spring I found that, with these cork soles, I can go all around in damp places, and my feet keep dry—almost as much so as if I were wearing rubbers. Rubbers are all right; but for one who goes in and out of the apiary, as I do, they are never on when I need them the most; and these cork soles are ready for all kinds of weather.

Oh, yes! I also wear pointed toes, and I consider them a great comfort. The point forms

plenty of room and air for the great toe. Put me down as in favor of thick cork-sole shoes with pointed toes, A. I. R. notwithstanding.

DRAWN FOUNDATION AS VIEWED BY ANOTHER EDITOR.

IN the last issue of the *Southland Queen* the editor speaks very hopefully in regard to the new deep-cell foundation. This is what he has to say:

We have received samples of the Root deep-cell foundation, and it is as nice as any kind of foundation we have seen; and, while we have not tried it, on account of a honey-dearth being on ever since it came, we do believe it will prove a boon to the extracted-honey producers, if not to the comb-honey raisers. We have had a flow on three days; and as we have been shipping a great many bees lately, we are scarce of combs, and we now ask a question: "Who will be able to tell us what drawn combs or deep-cell foundation would be worth to us just now?" Yea, who can estimate it? If we had this comb to use in 200 strong colonies to-day we should likely get ten to twenty tons of honey in the next ten days, while, as it is, the flow may come and go before the bees can build comb to store the honey in.

A little further on, in the same editorial, referring to the attack upon the article elsewhere in the same journal, the editor says:

On page 15 of this issue, Bro. Hyde puts forth the idea that this drawn comb is a fraud. Now, while it may look a little as though it would injure the sale of comb honey, how can it be classed as a fraud? As a rule, frauds are something that get our money without an equivalent, and this deep-cell foundation will be sold, we suppose, in the same manner as other foundation to those who wish to purchase; and, as one good friend says, "If this deep-cell foundation is a good thing it will go; and if it is not, it will not be long heard of." We think that is just it to a T, and we have no right to be kicking until we have something to be kicking at, and this is just why we have kept as still as we have.

QUEENS IN THE MAILS.

A SHORT time ago you may remember I reported, from information which seemed pretty straight, that there was a movement on foot in the Postoffice Department to bar queen-bees out of the mails. The United States Bee-keepers' Union promptly took the matter up. General Manager Secor wrote to the department, asking if there was any truth in the report, and received the following letter, which will explain itself:

POSTOFFICE DEPARTMENT.
OFFICE OF THE GENERAL SUPERINTENDENT RAILWAY MAIL SERVICE,
WASHINGTON, D. C., May 14, 1897.

Respectfully returned to Mr. Eugene Secor, Forest City, Iowa.

There must be some mistake about this matter, as no one at the department has any knowledge of a change of the regulations excluding queen-bees being contemplated.

JAMES E. WHITE,
General Superintendent.

This settles the matter. While it did not seem possible that queens should be excluded from the mails, it seemed to be advisable to be forewarned and thus forearmed. The privilege we enjoy of sending queens in the mails is so great that we can not afford to take any chances. In another column there is a case of

carelessness reported on the part of a bee-keeper who ought to be severely reprimanded by the whole fraternity.

J. VAN DEUSEN.

In our issue for May 1 appeared an obituary notice of Mr. J. Van Deusen, senior member of the firm of J. Van Deusen & Sons. Mr. V. was 83 years old at the time of his death, and one of the veterans in the bee business. For years the firm with which he was connected has been noted for turning out a beautiful translucent, flat-bottom foundation. The old gentleman had a secret process of sheeting, and by this process he was enabled to turn out a beautiful article of foundation.

Mr. Van Deusen's face was quite familiar to those who were in the habit of attending the national conventions. One would hardly think that a man of his years could make as long journeys as he did, and yet seem to be hale and hearty, notwithstanding his age, at all the conventions at which we had the pleasure of meeting him. He always had with him samples of his goods, both wired and unwired.

He is the only one, I think, who ever, in a commercial way, incorporated wires into the



J. VAN DEUSEN.

foundation itself, the wire being inserted, evidently, in the process of milling. It is doubtful whether the wire could be inserted in the natural-base foundation. It *could* be put in, but would be kinked up by the faces of the mill, so as to make it practically a rail fence that would stretch as much as the foundation itself.

The firm is still operating, the younger member, I believe, having charge of the business,

and I have no doubt the quality of goods will be up to its former high state of excellence.

It is a pleasure for me to state that the half-tone portrait is very natural, and will be instantly recognized as such by all who have had the pleasure of meeting the senior Van Deusen at the various conventions.

A HONEY-LEAFLET IN ENGLAND.

A LITTLE pamphlet entitled "Honey and its Uses," by Rev. Gerard W. Banks, is being circulated, as I judge, among honey-consumers in England. There are several good things in it, and from among them I make the following extracts:

Apart from the consideration of the many other valuable properties claimed for honey, the following facts, which seem well authenticated, must certainly go far to recommend its use as an article of food:

1. The sugar of honey, being in the most suitable form for assimilation, requires hardly any digestion. It is in a condition to enter at once into the system.

2. It is, in a usual way, not liable to occasion any disorder of the system, and may therefore generally be used by those with whom ordinary sugar is found to disagree.

3. The grape sugar of honey does not cause decay of the teeth as cane sugar does.

These statements, of course, have reference only to honey that is absolutely *pure*. Erroneous opinions, and much mistaken prejudice, have unfortunately arisen with regard to the use of honey, owing to the unpleasant effects upon many persons of the various compounds, consisting chiefly of glucose made from potatoes or rice, and sulphuric acid, which of late years have been in such large quantities sold as a substitute for pure honey. It is of the greatest importance, if its beneficial effects are to be enjoyed, that the honey consumed be pure.

Till comparatively recent times honey was the chief sweetening agent in use. After the introduction of cane sugar, however, the use of honey in this and other countries largely declined. But there is no doubt that of late years it has been more and more realized that pure honey does possess qualities which it is impossible to replace. There has been a larger and ever increasing demand for it, till there seems every prospect of its coming again into general use in every household. Thousands of tons of honey are now annually consumed in this country; while in North America alone, it is estimated that more than a hundred million pounds are produced every year.

But it is not only as a palatable and nourishing food that honey has again come to be so highly appreciated. It is now pretty generally acknowledged to be a really valuable medicine. And when we bear in mind that the nectar gathered by the bee is a secretion in which we may expect to find the essential virtues of the plant from which it is obtained, that there is more or less pollen always present, and that, when converted into honey, it contains, in addition, a certain amount of formic acid, we can easily account for its wonderful medicinal properties.

Honey is especially recommended as likely to be beneficial in cases of dyspepsia, rheumatism, asthma, hoarseness, shortness of breath, and all affections of the chest. Consumptive people are known to have derived great benefit from its continued use, and it is said to have been recently often used as a substitute for cod-liver oil, with very satisfactory results.

In bronchitis great relief may be obtained by taking a small quantity at frequent intervals. The regular use of it is said to aid digestion, and to strengthen the nerves. As a gentle laxative, and purifier of the blood, no better medicine can be taken; while its peculiar acid property has caused it to be generally recognized as a valuable medicine in cases of sore throat. Indeed, for coughs, colds, and all affections of the throat it is universally acknowledged to be the best of remedies.



Owing to the unusual amount of wet weather I did not get off for a wheelride this spring until yesterday, May 18. Once more I passed through that remarkable experience of a long wheelride. For some time back I have been troubled with my old chills. I have been wearing my overcoat and fur cap. In fact, I debated some as to whether I should not take my overcoat along when I started out for my ride. For some days back I have been getting so tired before noon and before night that I really began to question whether I had strength enough for a long ride. A good nap of about an hour before dinner, and another one before supper, had helped me to get along and look after my appointed part of the work. Well, I decided to leave my overcoat at home, even though I felt chilly for the first four or five miles. I not only felt chilly, but began to get tired; and had it not been for my previous experience I think I should have turned around and gone back home and given it up, thinking I was too old and too much out of health for any such hard exertion. After I had gone about ten miles, however, I was singing my old hymns, and thanking God for the "second wind" that was beginning to thrill my whole being. When the usual time for my nap came I felt unusually wide awake; and in an hour later I was in excellent trim for a good dinner which I found at a hotel on my route. I rode the last ten miles in my shirtsleeves, with my coat tied to the handle-bar, and I wished several times I had one of my summer hats instead of the fur cap. I made about 30 miles easily, and arrived home just in time to take charge of the boys, and worked hard until supper-time, with no thought of a nap, and then helped to push some other work that needed to be done, until well toward sundown. Then I slept a good hour as only the tired laborer can sleep, and had an excellent night's rest after that. During the latter part of my ride I chose an untraveled road because it was shorter, and this threw me into a good perspiration. After I arrived home I drank as much water at intervals (from that new soft-water well) as I drink ordinarily in a whole week. To-day I am feeling very much better than if I had not taken any ride at all.

But most of my readers, I suppose, know all about this. Wheels are now so common that it is hardly worth while to go over such experiences, and I have given this mainly for the benefit of the elderly ones who think they are getting to be too old, or that their health is too poor for such youthful sports. Perhaps some of you wonder why the craze for wheeling holds out, and increases to such an extent. Well, I suppose it is for the reason I have just given above.

At the Creston celery-farm I found my friends all busy; and expert women were swiftly transplanting the little seedlings into boxes, on the plan I have several times described. These boxes were then put in the hot-beds outside. And, by the way, this perhaps quarter of an acre of hot-beds and cold-frames is a sight indeed. I wish I might give you a photograph of it. It reminded me of the chapter in our tomato-book, about supporting a family on a quarter of an acre. Mr. Jordan says this quarter-acre would keep a pretty good-sized family busy several months in the year. Some

of the beds are covered with cloth, and some with the glass sashes. All of the glass is, however, whitewashed at this season of the year. The greater part of the beds have pipes underneath them for steam heat; but this spring they have added a new block without steam heat. These answer every purpose a little later in the season, or they will answer earlier for hardening off plants that are pretty well rooted. By keeping the beds damp with plenty of water and a cotton-sheeting covering, they make them stand up from the day they are planted until they are ready to go out into the field. In fact, I saw one bed full of plants put out only yesterday, and every leaf stood up apparently full of life and health—no hurt from the transplanting process whatever; and yet when the plants are taken from the seed-bed the soil all drops off, and nothing but the naked roots are put into the boxes. This speaks well for their compost of swamp-muck and well-rotted manure.

It seems to me I never saw such beautiful beds filled with boxes of plants. These boxes are lifted into a wagon made for the purpose, and carried right out into the field; and their arrangements were so complete that it did not seem to me as if there was a missing plant in ten thousand. Each plant has a great bushy root, and in fact this bushy root carries along a goodly lump of the compost contained in the box in which it grew. This compost is swamp muck, two parts, old well-rotted manure one part, thoroughly commingled.

Before I got in sight of the grounds I broke forth in an exclamation of surprise. Yes, I have done this a good many times at the beauty of these newly planted celery-fields, but *this* time there was a new surprise. Off in the distance there was something more enchanting than any thing I had ever seen before. It was a whole block of *five acres* devoted to the new celery culture. The Jordan Brothers, however, have modified the process somewhat, so as to fit appliances of their own. The plants were spaced at an exact distance of $3\frac{1}{2}$ inches apart in the row, and the rows were a foot apart. This spacing is all done by appropriate machinery. The rows run crosswise of the beds, and they are just 15 feet long. Then between the beds there is an alley or driveway wide enough for a narrow-tracked wagon. This driveway is to carry in the boards, and to afford a place for the workmen to stand as they handle the boards and place them up against the rows of plants. It is the "new celery culture," but they use boards for bleaching. They say they do not get any real nice celery without the boards. Now, with the rows 15 feet long, and the boards 16 feet, a man in each alley can place them without tramping on the plants at all. You see they have my idea of plant-beds so the ground need not be tramped down hard. They use about 24 tons of good stable manure to the acre, besides a large quantity of bone-dust, and ashes or potash in some other form. □

The variety used almost exclusively is the Golden Self-blanching; and it was this golden color that caught my eye. No flowering plants ever grown by florist were so handsome to my eye as that block of five acres. It looked as if a gorgeous sunset had blazed down for a moment on that little square block of swamp muck. What astonished me was to see each plant so exactly like its neighbor; and there they stood, thousands upon thousands—no failures, no weak puny plants. Mr. Jordan put down his hand and pushed away the muck to let me see the great masses of snow-white roots that were reaching out for food and drink.

I took a new route home. In my wheelrides

you know I always take a new road when I can. Constance says this is so I shall get lost and have some adventure. I did not get lost this time. I did, however, run across another celery-ranch. A bright gleam of color caught my eye from a sort of plant bed or greenhouse. This bit of color was Grand Rapids lettuce. It was still standing in the seed-bed; but its cotton-cloth covering had bleached it so it had that fascinating light green, almost white. I asked the young man who owned the ranch if his lettuce-plants were not getting pretty tall. He explained that they cut off the tops with shears, and used or sold the lettuce, and then waited until the roots had started again, producing much the same result as transplanting, with less expense. This man had an engine to warm his beds and pump his water, and a lot of iron pipe to carry the water all over his little farm. He has not got his drainage quite as perfect yet as the Jordan Brothers, but I think he will make a success of it eventually. In drilling for water he struck a flowing well—at least the water boils up over the top of the iron pipe, and runs away. The water rises only a little higher than the level of the surface water in his ditches.

Further on I visited the onion-farm of Mr. Barnhart, and found him using one of the Breed weeders I illustrated in our previous issue. Excessive rains prevented him from using the weeder so as to kill the weeds before they were "borned;" but his men were at work with wheel-hoes and weeders, getting his patch ready so the weeder would do the work for the rest of the season if we are not drowned out by too many heavy rains. If the price of onions will only hold up to \$1.50 a bushel or \$5.00 a barrel, what a picnic we shall have when marketing time comes! and, as usual, I expect to have American Pearls and Whittakers on the market before anybody else has any thing large enough to call an onion.

OUR HOMES.

And it came to pass the same day, that Isaac's servants came and told him concerning the well which they had digged, and said unto him, We have found water.—GEN. 26:32.

□ And whatsoever ye shall ask in my name, that will I do, that the Father may be glorified in the Son.—JOHN 14:13.

That whole 26th chapter of Genesis has always been interesting to me because it has so much to say about digging wells. In my earliest childhood I was greatly interested in wells and springs, especially the soft-water springs round about my hilly home in Mogadore, Summit Co., O.; and I soon learned to enjoy drinking the pure cool water from certain springs; and when away from home, where I was obliged to drink hard water from wells, I always found it quite a cross. In view of this it is not strange that, when the oil excitement broke out in 1860, I became deeply interested in exploring the depths of old Mother Earth for the treasures (or God's gifts, if you choose) which were just then found to be stored away, awaiting man's energy and inventive genius to bring them to light. I have told you about well-digging on our own premises, and of the two soft-water wells that rejoiced our hearts as a reward for our researches in the way of well-digging or drilling, rather. And, by the way, I am now feeling happy every day because one of those wells I told you about is now supplying our whole town of Medina with pure soft

water. While putting in new waterworks there was no readily available plan of keeping the town supplied unless the pumping-engine was located at our first soft-water well; and it is at this very moment while I write doing duty by supplying the town.

Perhaps I have already told you that we have digged and drilled seven different wells on our premises, and all of these have been put down since we came here, nineteen years ago. After securing these two wells of soft water, especially when we were using only *one* of them for our own premises, it would seem that we should be content. Not so, however. The well at the windmill upon the hill was put down 99 feet, and gave an abundance of very hard water, unfit for steam-boilers, and unfit for *drinking* after you have once tried the water from the soft-water wells—at least, that would be my verdict.

The windmill has been standing idle ever since the soft water was found. It must have continued to stand idle unless we did one of two things—move it down to the creek bottom, where there is comparatively little wind unless we have a very expensive high tower, or drill the well deeper at the windmill, so as to strike the same vein of soft water. We finally decided, during the month of March, to try drilling the well deeper. The well-driller preferred to make an entirely new well at his usual price—something like a dollar a foot for a six or eight inch bore. He said he did not like to fuss with wells already put down; but he agreed, however, to work for me, giving the use of his tools, and one man besides himself, for a dollar an hour; but I had to take all chances of pulling up the old tubing, and getting the smaller hole reamed out, etc. I chose the latter plan. In the first place, it was somewhat doubtful whether the old tubing could be pulled out, for it was driven very securely into the rock (sixty feet deep), and had been in place over seven years.

We procured a stick of timber for a lever, 30 feet long; made a very substantial foundation for a fulcrum; and although we succeeded in breaking our heavy chasms, the tubing would not budge. After we had wasted considerable money in this way, we substituted two powerful screws in place of the lever. Once more it seemed as if no power on earth could pull up that iron pipe. We might pull it in two, but it seemed so firmly imbedded or driven into the rock that it would never move. I began to feel nervous over so much waste of time and money, and, as a matter of course, began to pray that God would help us in our efforts to get pure water, as I had prayed more or less over all the other wells on our premises.

"Boys, are we not getting it started just a little?"

The man who was bossing the job replied:

"I do not think, Mr. Root, it has started a particle."

I had prayed over the matter in the morning before starting the work, and I mentally prayed again that God might help us where we seemed to be helpless. If I remember correctly, it was not many minutes after this silent prayer, that somebody called out:

"We are all right! she's starting!"

□ We could hardly believe the good news until careful measurement showed that it had moved something like an eighth of an inch. The screws were turned again until every thing began to snap, and the boss told us to hold on a little and give it *time* to come. Pretty soon we had made a whole quarter-inch; then a whole inch; finally several inches, and the little steam-engine with its powerful derrick soon

grabbed hold of the rusted tubing and laid it safely on the bank. We were all right. But the rock was now found to be 60 feet deep instead of 40, as I had estimated it. No record had been kept of our former drilling; therefore we were at a standstill until some more eight-inch casing could be ordered. The men were on hand, the machinery in position, and every thing ready to go on. We telegraphed for tubing, but it did not come, and could not be found. The owner of the machinery consented to wait a reasonable time at his own expense; but when day after day passed, and no trace, even when we wired tracers again and again for it, I presume he too began to tire of waiting.

Dear friends, on some accounts I dislike to tell in public print how I have worked and prayed in building up our present business. I do not feel backward about telling my wife or my good old mother about these answers to prayer; but I have often thought I ought to be very careful about telling these things in such a public place as a printed journal like this. I would say to you, however, that this little incident about drilling this well is no new experience of mine. For nearly twenty years past, or ever since my conversion, it has been my daily custom to breathe that little prayer, "Lord, help!" whenever I get into any sort of trouble. Of course, I keep in mind that God can not consistently answer my prayer unless my undertaking is a praiseworthy one. If I were going to build a finer house than my neighbor's, or if I wanted a gold watch and massive gold chain to make people stare, I should not think of asking God to help me in getting either one. No doubt many of my desires are selfish ones, for I am human, and sometimes I am led to feel that I am *exceedingly* human. We are told in God's holy word, "If I regard iniquity in my heart, the Lord will not hear me." Therefore he who expects the Lord to hear and answer his prayer must be very careful that no iniquity or selfishness is at the bottom of his undertakings.

The pipe did not come. My friend over at the depot, the agent, said there was no possible way for the tubing to get here before the next afternoon; and the owner of the well-machinery did not want to wait much if any longer, unless I paid him for his time. Besides, I felt impatient at the delay, and was exceedingly anxious to have the work go on. I was up quite early next morning. The weather was just beautiful for this outdoor work, and we had been having previously some very bad weather. I was up in that particular room in the office where I often pray over my plans, and I was wondering if that tubing could not come in some unexpected way so we could have it right off that morning, notwithstanding what the agent said. I remembered that passage in Scripture which says, "The Lord's hand is not shortened,"* and the other one that speaks about even the winds and the waves obeying him. I prayed that, if it were consistent with God's will, he might, in some way beyond my comprehension, bring about the missing pipe, even before the afternoon train. I went downstairs with a lighter heart. Just then one of the men who had come early to commence his day's work said to me with a smile, "Mr. Root, that iron pipe you wanted so badly lies out there on the end of the sidewalk."

You may be sure I was somewhat startled. Yes, I have been startled in this way many times before. The explanation of it was quite

a simple matter after all. The railroad company, by some blunder, had carried the pipe past its destination. They brought it back and unloaded it some time in the night. The foreman of the lumber-yard, knowing how badly I wanted it, had pulled it up on his horse-car and placed it where I might have almost stumbled over it. In fact, it was lying right there in plain sight at the *very time* I was praying about it. Some of you may suggest that it was no answer to prayer at all, because the prayer had nothing to do with it. It was *already* there. In reply, let me refer you to a passage in Isaiah, 65th chapter, which says, "Before they call I will answer; and while they are yet speaking, I will hear."

Please be patient with me once more, dear reader. The large eight-inch well-casing I had purchased was second-hand. I chose this kind because it was a good deal cheaper; and as it was to be pulled out afterward it would likely answer every purpose. When it was nearly down to the rock (in order to cut off the hard surface water) the well-man stopped and listened. Water was pouring down in the well. In fact, there was a little waterfall. I laughed, but he looked sober. Said he:

"There is a break in that casing. I was afraid of it, as it was so old and thin."

They put on the tongs in order to see if it could be screwed up; but he soon announced that the thread was spoiled away down in the well, and then he looked more troubled still. Said I:

"Mr. H., can't we pull it up and fix it?"

"We can pull up the top part of it, but there is no way in the world to pull up the lower part, that I know of."

All at once I thought of my answers to prayer in pulling out the old tubing, and in having this very same new casing delivered that morning right at my feet when I so little expected it. To my poor human vision it did not seem probable that God would hear me in that way if it were to result in hopeless disaster like the one right before us. I said again, mentally, "Lord, help!" Let me explain that I was at the time worried with other cares down at the factory, besides this well business, and I could ill spare the time to look into the matter and direct what was to be done next, in order that the expensive men and machinery might not stand still waiting for direction.

"Mr. H., I can hardly believe the pipe has pulled in two. Put on your tools and see if it is not possible to screw it up so it will hold at least long enough to draw it out."

"I will do just as you say, but I am sure it is not a bit of use. We have turned it and turned it; and from its actions I am satisfied it just slips a thread every time we go around. The top will lift right off, but the bottom is *gone*."

I was thinking of the duties and responsibilities that called me to other places, but waited until they began turning the great pipe to see if it might not catch on again. Pretty soon the face of the manager began to soften into a smile. Finally he said:

"Well, I declare! I believe that has caught and screwed down solid; but I never before, in all my experience, saw any thing get into shape away down in the ground like that."

They tapped it gently with the big pile-driver hammer, and it seemed to go down all right. Another piece was screwed on, and before night it was firm and solid in the great bed-rock, and we were ready to go on with our drilling. Mrs. Root and some others asked how we could be sure of getting soft water away up there on the hill. I replied that there was hardly a question about it, for we had got soft water in so many

* Behold, the Lord's hand is not shortened, that it can not save; neither his ear heavy, that it can not hear.—ISA. 59:1.

places; and when word came to me along in the afternoon that they had got the soft water, I remember distinctly of feeling a little ashamed of myself *because* I did not thank God more earnestly in my heart for having brought us safely through our troubles, and enabled us to secure the coveted soft water once more. I directed, however, that they should drill five or ten feet deeper in order that the sediment might settle below the point where we expected to place the pump. Well, after we had drilled five or six feet *the water was hard*. I did not examine the water myself, or at least not very thoroughly, when they told me they had soft water. It was now *unquestionably* hard. We put down the pump and worked it for several hours. There were great quantities of water, but it was unfit to put into the great tank beside the windmill. It would spoil all of our good water. I was a good deal disappointed. I feel ashamed to acknowledge it, but I am afraid I began to be just a little doubtful in regard to those strange answers to my prayers at the different times I have spoken of. I am afraid I was forgetting one of my good old father's texts—"Though he slay me, yet will I trust in him."

Please, friends, do not pass judgment on my Home talk in this issue until you hear what further I have to say on the same matter; and do not, let me beg of you, lose your faith in the great God above, even if he does *not* give you just what you ask for, in just the way you *expected* it to come.



HOW TO TELL WHEN THERE IS GOING TO BE A FROST.

Candidly, I don't know; but I do know from experience something about it. On the night of May 20 we had a big rain. Before the rain the thermometer stood between 70 and 80. The next morning it was down to 50; and I knew, before the Weather Bureau said so, that the conditions were going to be favorable for a frost that night—that is, if it cleared off. So you may be sure I watched both the thermometer and the barometer all day long. About a week ago the indications were so strong for a frost that we spent a couple of dollars in getting our sashes on, and covering tomatoes, strawberries (that had been grown under glass), etc., for three nights. We came very near frost, but there was not any to do any damage. All our fuss in carrying things, and the attendant litter, was time wasted. A year or two ago, however, one night when I decided to take the chances, we had lots of nice tomatoes badly damaged after I had carried them through March, April, and a part of May. Well, last evening I felt very much averse to getting out our sashes again. They were nicely put away for the season, with the big boxes that sit over them inclosing and protecting each pile. It is heavy business lifting off those large boxes, and we almost always have more or less broken glass in handling our 150 sashes. I was watching the barometer and thermometer, watching the wind, and watching the clouds. The boys were quite willing to go to work and make every thing safe, but I told them I would take the chances.

By the way, just across the street from where I write there are some of the Earliest in the

World tomatoes trained upon poles. Some of them are three feet high already; and I tell you it is a job to blanket them. We did it, however, last Saturday night, and the structure looked so queer that passersby began to banter me about fixing for a variety show. On Sunday morning, before I got my cotton sheeting and other "drapery" off from the plants a horse got frightened at the unusual spectacle. Well, in thinking this all over I decided to take my chances, even though the barometer was hitching up a little for a clear night, and the thermometer was down to just about 50 at sundown. (One of our rules has been that there is never much danger of frost while the mercury stands above 50° at sundown.) Besides, it was a little cloudy in the west, and I told the boys they might all go home. Just as the sun was disappearing, however, it met a streak of clear sky under the clouds; and by nine o'clock we had a clear starry night. The thermometer, however, stood a little above 40. I got up at midnight, and the mercury was down to 38°. I told Mrs. Root I was going to have a "picnic" about the first glimpse of dawn; for I had noticed several times that the coldest period was between dawn and sunrise. In fact, I have seen plants frozen *after* sunrise that were not hurt a bit until that time. At half-past three it was light enough to see, and the thermometer stood at 36°. The frost was white and thick on the roofs of buildings, sidewalks, and every piece of exposed timber. At first I thought the tomato-leaves were frosted; but a little more daylight showed they were simply loaded with a very heavy dew.

When the thermometer got down to 35½ I began to think I should have to call up Huber to help me cover up the stuff, even to protect it for a single hour. I walked all over the garden, watched Nature's performances, and then held my breath (so as not to breathe on the bulb) while I watched the thermometer again. It would not budge a bit from 35½. About four o'clock, however, it was perceptibly rising, and I began to rejoice. At half-past four it went down again all it had risen, and a little more. I climbed up to the highest point accessible, and watched for the sun. I would have hurried old Sol up a little, but I did not know how. When his rays began to touch the top of the windmill tower the thermometer deigned to hitch up a little. I kept fingering the tomato-leaves, and saw they were all right. When the sun was clear up above the horizon, and his rays burst forth in all their glory over the tomato-plants and every thing else, *then* I rejoiced. Not a sash had been moved, not a sheet or blanket carried out, and my whole garden was unharmed. Out in the apiary a few sweet-potato plants had their foliage blackened a little—that was all.

I have gone into all these details, dear readers, because it is exceedingly important that the gardener should learn to judge with considerable accuracy, that he may not waste money in handling sashes needlessly, and, on the other hand, that he may not take risks recklessly, and do a worse thing. Now, if you know of any better way of steering clear of both these extremes I should be very glad indeed to get hints on the subject. □

THE "EARLIEST" STRAWBERRY.

These berries are now ripe, but there are not very many of them. Thompson's Sons, of Rio Vista, Va., say that it will be more productive in two or three year-old beds. This I can readily understand, if the runners are pulled off. In fact, by the way it commences to send out runners as soon as blossom-buds are visible I

feared we should never get any good berries unless I pinched the runners off, which I did on a few, and the berries are very much finer and larger. The introducer says one dozen plants will make a *thousand* on ordinary soil in a single season. The shape is perfect. The color is pretty light, and the berry is soft. But it is so far ahead of every thing else in ripening that I think it will be worth while to have at least a small plot of it on which to open up the season. It very much resembles Michel's Early, but I think it is considerably earlier—probably just about as productive. My impression is that all berries of this class should be planted in hills, and the runners kept off.

WHAT STRAWBERRY AMONG OUR WELL-KNOWN VARIETIES WILL GIVE THE GREATEST NUMBER OF BUSHELS PER ACRE?

"Mr. Green, the Ontario Experiment Farm have made a test of 121 varieties of strawberries, including almost everything that is known and talked about, and they have given the number of ounces produced by one dozen plants—that is, one dozen plants were put out and allowed to make a matted row, and the berries were gathered and weighed the next season. Now, can you guess which plant gave the largest number of ounces in the whole 121?"

My remarks were made to Mr. E. C. Green, who was formerly connected with our Ohio Experimental Farm. As I spoke he smiled good-naturedly, tipped his head a little to one side, and said:

"The largest yield? Let me see. Why, I shouldn't wonder if our old friend Warfield has found a place pretty near to, if not *quite* at the head of the list."

Then I had a big laugh. As sure as you live, Warfield heads the list of the whole 121, with a yield of 294 ounces. Edgar Queen comes *third*, with 244. Haverland falls in line as No. 10, with 205 oz. You may be sure I felt a little pleased to find at least three that we have held on to for many years standing so near the head. Bubach comes along as No. 18, with a yield of 185 oz. Michel's Early is 48, 140 oz. I have not retained this because of its large yield, by any means, but because it was earlier than any thing else, Jessie comes in 66 in the line, with 105 oz. On our grounds I think it would do rather better than this, although it does *not* do tiptop except during an occasional season. I was a little disappointed to see the Marshall put just one ahead of Jessie, and I was still more surprised to find Parker Earle No. 91, at only 56 oz. The truth is, the Parker Earle wanted richer ground and larger quantities of manure.

Now, what do you suppose was the *poorest* in the lot? Why, it is the Alpine Everbearing; and it would hardly be worth while to give the Alpine a place at all were it not that it furnishes a few berries all summer long, and these few have that wonderfully delicious musky flavor.

Let me now go back to No. 1. It has been one of my favorites for a good many years, and I feel like petting it a little, as below:

"Dear little Warfield, it rejoices my heart to see my faithful little friend given such a *high* post of honor. Your berries are not as large as the Bubach, Sharpless, and some of the newer varieties, it is true; but not one of them all has that beautiful rich garnet that makes it shine like a *gem*, as you do down among the green foliage. And there is no *humbug* about your shining, either, dear little friend; for whenever one utters an exclamation of surprise at your beauty—beauty in shape and beauty in color—he gives place to a still more joyful expression

of pleasure when he tastes that delicious tartness; and I suspect, little friend, that if you had plenty of room, rich soil, and had the runners taken off, as we do with some of the newer kinds, you would show us some wonders in the way of *size* that you can not when everybody lets you set the plants so thickly that it makes me think of a family of children so large that the good mother can hardly find food for them all."

CRIMSON CLOVER.

Our crimson clover is now in full bloom, and it is a sight indeed. I learn from Prof. Thorne, of the Ohio Experiment Station, that they also have succeeded during this last winter in wintering it over. A neighbor was in here a few hours ago, who says he has ten acres. It was sown among corn at the last cultivating. He thinks the stand was almost as good as mine. He plowed it under, and is now going to grow corn again on the same ground. From reports received it seems to be succeeding well through Northern Ohio, especially along near the lake, and several reports have come of successful wintering in York State.

POTATO-BUGS ON TOMATO-VINES.

If you plant tomatoes on ground that potatoes have occupied the year before, you will be sure to be troubled with bugs; and if you do not look out they will eat up your tomato-vines entirely. Dust them with Paris green, just as you do potato-vines. Any of the dust-distributing machines we advertise will do it to a dot. A very little of the Paris green suffices, and it lays them out almost instantly.

THE GLEANINGS CONTRIBUTION FOR THE STARVING PEOPLE IN INDIA.

We did not expect to open a subscription-list in GLEANINGS for this purpose, but I do not see but we shall be compelled to do so. See below:

A. I. Root:—I read to day in your journal of the famine-stricken people in India. Inclosed find \$2.00 which I wish to send to them. I knew of no place to send the money, so I thought you would see that it reached them.

Calamus, Iowa, May 21.

LYDIA WAGNER.

Mr. Root:—A woman in Kansas sent me this five-dollar bill, to have me put a white wreath on a friend's grave next Sunday morning. I will put the wreath on the grave, as she desires, but it seems too bad for so little good. I will send it to you, to send the quickest way to help some of those famishing children in that land of darkness and drouth. May the Lord's blessing go with it.

Pleasant Hill, Mo., May 25. GEO. M. KELLOGG.

We will add \$25.00 to the above, from the A. I. Root Co., and forward the whole to Sec'y Judson Smith, D. D., Congregational House, Boston. To save time I would advise contributors to remit direct as above. You can, at the same time, inform us what amount you sent, and we will publish your letters, if brief, in this department of GLEANINGS. God will surely bless those who make a sacrifice to relieve starvation and suffering.

THE AIR-SHIP.

I am told there is an air-ship, after all, and they have it at the National Exposition at Nashville. I am very well aware that they have a balloon there that they call an air-ship; but a balloon that goes wherever the wind happens to blow it is quite a different affair, dear friends, from a ship that sails through the air wherever one wants to go, as a steamship goes over the water to its destination.